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- **WHAT** is its real measure?
- **HOW** should it be corrected?
- **WHY** you must correct it

SPECIAL REPORT page 28

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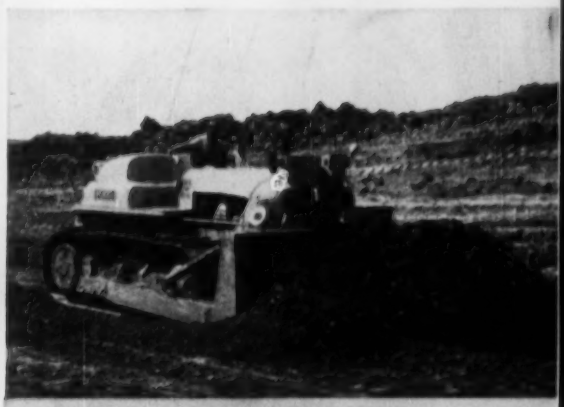

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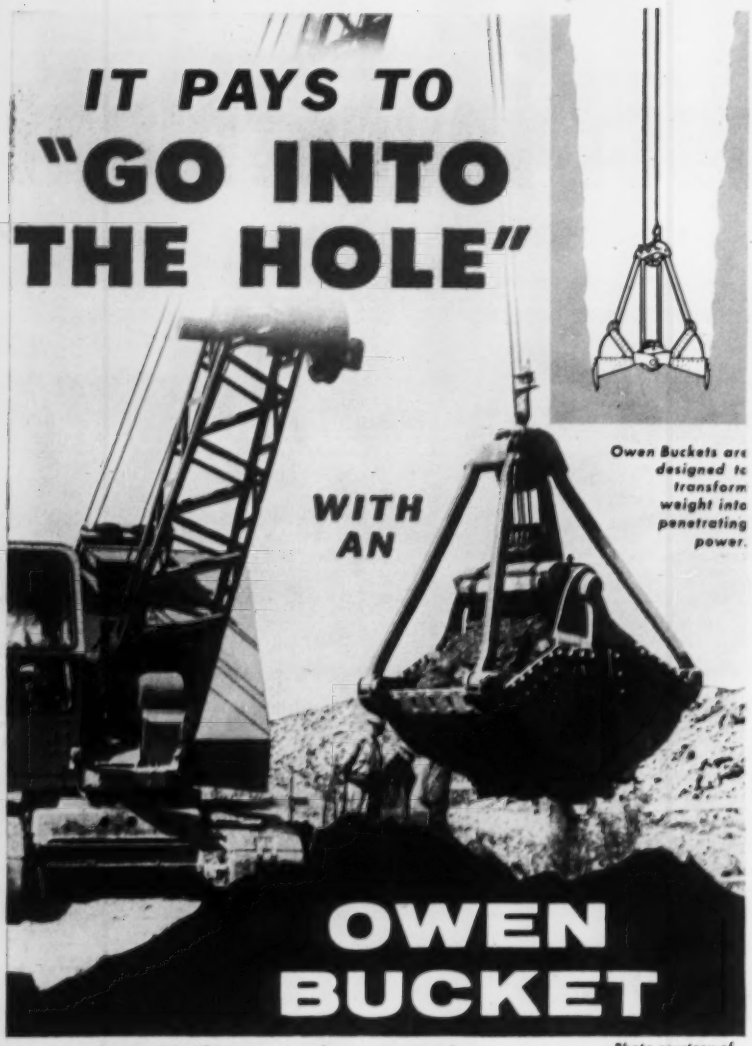

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Reader Comment

Good Cost Record

SIR—Your article on the Lake Pontchartrain Bridge (ENR Aug. 30, p. 30) was particularly interesting to me since the 430,000 ft of precast, prestressed cylindrical piles used were manufactured and installed according to our designs.

One fact about this bridge that has not been discussed is the unusual cost of its construction over anything that has been built during the past twelve years. Notwithstanding the fact that we had to go approximately 80 ft below water surface to get good bearing, the cost per ft was under $8. This is only about 50% more than the cost in 1924 of a four-mile bridge across the east end of Lake Pontchartrain using precast piles and cast-in-place deck. This was accomplished in spite of an increase of almost eight times in common labor costs and more than twice in material costs. In my opinion, these are facts of great significance during this high cost period.

MAXWELL M. UPSON
Chairman of the Board
Raymond Concrete Pile Co.
New York.

Israel's Progress

SIR—Your editorial, "Underdeveloped Countries" (ENR Sept. 20, p. 132) implied that Israel's economic progress has been a failure. Nothing can be further from the truth. The economic progress in Israel, accomplished despite many adverse conditions, has won the acclaim of many leaders and experts.

The U. S. Operations Mission in Israel, in its report by Roswell H. Whitman in November, 1955, states that Israel's "record of accomplishments is impressive." It goes on to list some of these accomplishments:

"Since 1949, 135,000 permanent dwellings have been built and of 70,000 emergency dwellings for new immigrants, only about 12,000 tin and canvas huts and 17,00 wooden huts remain. Agricultural output has more than doubled since 1949, more acres are being cultivated than under

(*Reader Comment continued on p. 10*)

Engineering News-Record welcomes expression of opinion from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance.

Letters should be addressed: Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

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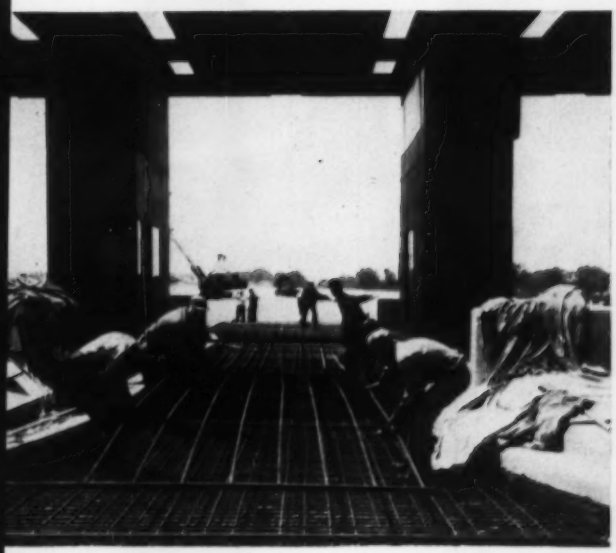

Entrance and exit lanes of the Indiana Toll Road plaza areas are being equipped with snow-melting systems to help make this new East-West highway the safest in the world. Aimed at eliminating up to 90% of winter traffic hazards due to stopping and starting, the melting systems will be thermostatically controlled as needed.

Boilers, located beside the toll plazas, will heat the heat-transfer medium which will be circulated through a network of steel pipe coils to keep surface temperatures above freezing. National Tube is supplying all the pipe, more than 157,000 feet, for the snow-melting systems at the 12 plazas. Over 104,000 feet of ¾-inch pipe is used in the snow-melting grids, and 53,000 feet of pipe up to 12-inch for other required tie-in lines.

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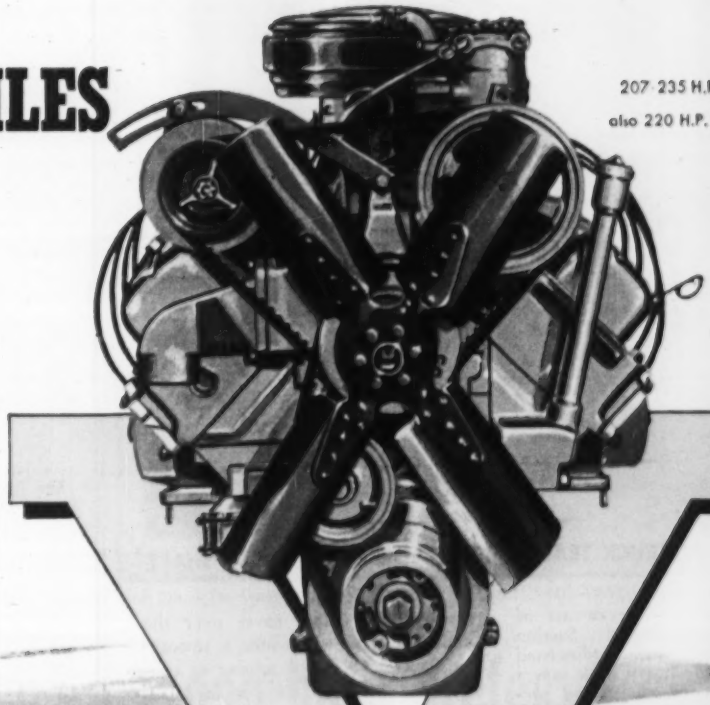

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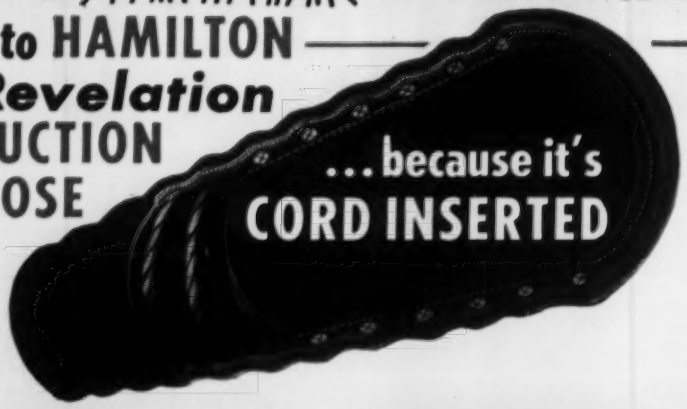

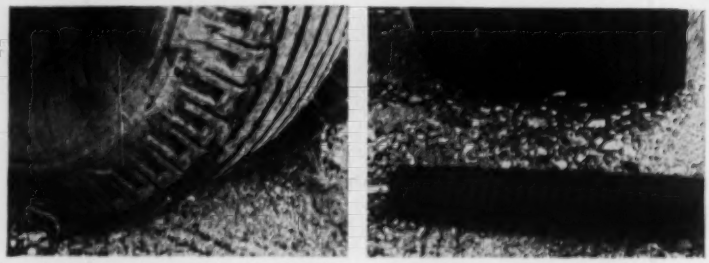

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. . . Reader Comment

the Mandate and the number of acres irrigated has increased from 70,000 to 185,000—nearly triple. Power used by industry increased from 96.9 million kwh in 1949 to 270 million kwh in 1954. Industrial capacity has at least doubled and many completely new industries, for example, tire and automobile assembly, have been added, new rail lines and roads have been built. And with all this physical growth imports have been reduced, exports increased, and Israel has made progress towards viability, with the trade deficit per capita reduced from $170 to $100 from 1949 to 1953."

On the particular subject mentioned in your editorial—the development of the Jordan River—any stalemate or delay in the implementation of this project is certainly not of Israel's making. Ever since October, 1953, Ambassador Johnston, President Eisenhower's Special Envoy, has discussed with both sides acceptance of a common irrigation and hydroelectric plan. Israel agreed to the Johnston Plan, although it meant that Israel would experience great difficulties in meeting her minimum water requirements. The Arab governments continue to oppose the plan.

Typical of Arab reaction was the statement of the Lebanese Premier, Dr. Abdullah el Yafi, who declared in March, 1956: "The Johnston Plan is intended to force peace with Israel upon the Arabs for the benefit of Israel. If the United States wants to help the Arabs, she should develop an Arab water project without Israel." They regard Israel's efforts to implement the water development scheme as "aggression" and threatened to shoot if Israel continues these projects. This attitude is in accordance with the general Arab position of opposing peace with Israel and attempting by all means possible to impede Israel's development.

H. Y. Orgel
Information Attache
Embassy of Israel
Washington, D. C.

[Editor's Note: The editorial reference was only to the failure of the Jordan Valley scheme and not to Israel's overall progress as Mr. Orgel shows. An article in ENR March 22, 1951, described the progress to that time, and much more has happend in the succeeding five years. Regardless of why the Jordan Valley development has not gone ahead—and Mr. Orgel gives Israel's version—the point of the editorial was that such inevitable impasses should not be allowed to discourage attempts to improve conditions in the underdeveloped countries.]

(Reader Comment continued on p. 12)

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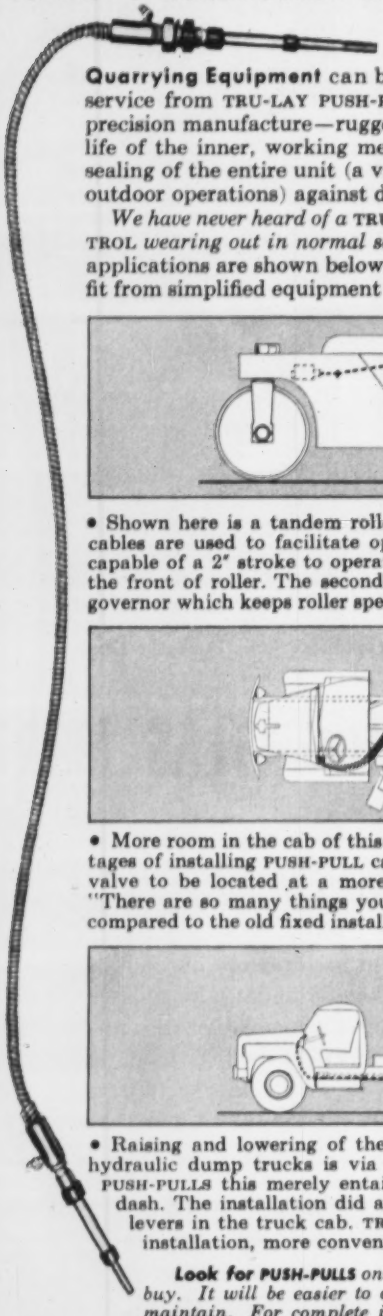

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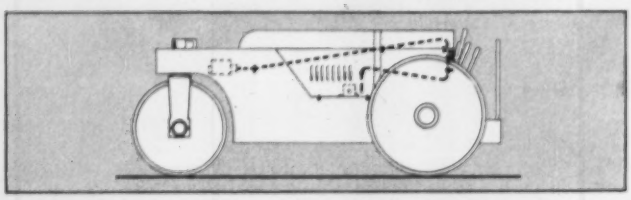
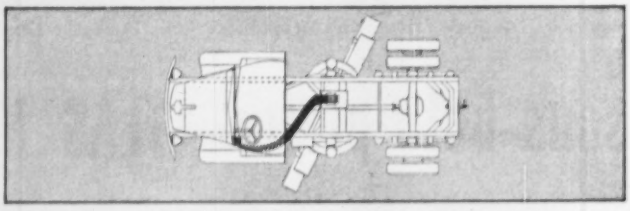
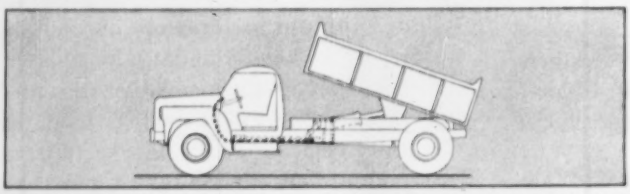


• Shown here is a tandem roller where two different PUSH-PULL cables are used to facilitate operation. One cable, 156" long, is capable of a 2" stroke to operate the hydraulic steering valve at the front of roller. The second, shorter cable operates tail shaft governor which keeps roller speed constant, upgrade or down.



• More room in the cab of this snow plow was one of the advantages of installing PUSH-PULL cables. This permitted the hydraulic valve to be located at a more convenient point in the chassis. "There are so many things you can do with these flexible cables compared to the old fixed installations," the manufacturer told us.



• Raising and lowering of the dump body on a famous line of hydraulic dump trucks is via TRU-LAY PUSH-PULL cables. With PUSH-PULLS this merely entails the pulling of a button on the dash. The installation did away with cut-up floor boards and levers in the truck cab. TRU-LAY PUSH-PULLS brought easier installation, more convenience and less maintenance.

***Look for* PUSH-PULLS** *on the heavy equipment you buy. It will be easier to operate and less costly to maintain. For complete information we'll be glad to send you this* DATA FILE . . .

ACCO

AUTOMOTIVE and AIRCRAFT DIVISION

AMERICAN CHAIN & CABLE

TRADE MARK

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Push-Pull DATA FILE

. . . Reader Comment

They're For It

SIR—We were interested in your reference in the Construction Week column of the Oct. 4 issue of your fine magazine to our recent annual meeting in San Francisco.

Unfortunately, you gained what we believe to be an incorrect impression of the sense of this meeting. While we discussed very frankly some of the problems connected with the large expansion about to take place in our highway system, and devoted considerable thought to the demands which this will put upon our profession, we did not say and do not believe that the program is either "too much" or "too soon."

The Institute of Traffic Engineers has been solidly behind the expanded highway program ever since it was first proposed. It represents a major challenge to the engineering profession, as I am sure you will agree, but a challenge which we believe will be successfully met.

DAVID M. BALDWIN
Executive Secretary
Institute of Traffic Engineers
Washington, D. C.

CALENDAR

American Public Health Association, annual convention, Convention Hall, Atlantic City, N. J., Nov. 12-16.

Building Research Institute, conference on windows and glass in the exterior of buildings, United States Chamber of Commerce, Washington, D. C., Nov. 14-15.

American Municipal Association, Annual American Municipal Congress, Chase and Park Plaza Hotels, St. Louis, Nov. 25-28.

Wire Reinforcement Institute, Inc., The Jung Hotel, New Orleans, La., Nov. 26-27.

American Association of State Highway Officials, annual meeting, Hotel Traymore, Atlantic City, N. J., Nov. 27-30.

Fourth Illinois Structural Engineering Conference, discussions on steel and concrete specifications, one-story building foundations and high-strength structural steel, University of Illinois, Urbana, Dec. 3-5.

Illinois Institute of Technology, Modern Builders Conference, Prudential Building, Chicago, Ill., Dec. 6-7.

American Road Builders Association, annual meeting and road show, Chicago Amphitheater, Jan. 28-Feb. 2.

Owner of one of 22 Barber-Greene Finishers on Kansas Turnpike reports:

"We're laying our second million tons..."

"Our Barber-Greene Finisher is now laying its second million tons of mix," states J. T. Blankenship, road foreman for J. B. Michaels & Company, Inc. of Memphis, Tennessee. "Here on the Kansas Turnpike our Barber-Greene will add over 75,000 more tons to its record. We're laying between 1800 and 2000 tons a day, working ten hours, frequently exceeding 200 tons per hour."

Here are some of the reasons why there are 22 Barber-Greene Finishers setting superior performance records on the Kansas Turnpike:

Top paving speed: The Barber-Greene will lay any mix as fast as any paving machine now in use with the same surface quality. Widest choice of laying speeds, including the lower speeds needed for difficult mixes, means every job can be done at the maximum speed.

Positive traction: Crawler mounting assures positive traction and steering control even while pushing loaded trucks up steep grades, on slippery primes or on soft bases.

Superior maneuverability: Short length and crawler mounting save valuable time in fast maneuvering or turning around, even in narrow streets or confined areas.

Ease of control: Operator has unrestricted view of truck dumping, material level in spreading screws, and finished mat.

Time-saving hopper: Receiving hopper is amply wide for fast truck changes and easy discharge, without spillage.

World-wide service and parts: Available from local stocks on short notice.

Write for literature on the finisher that handles all your paving jobs at less cost. 56-28F

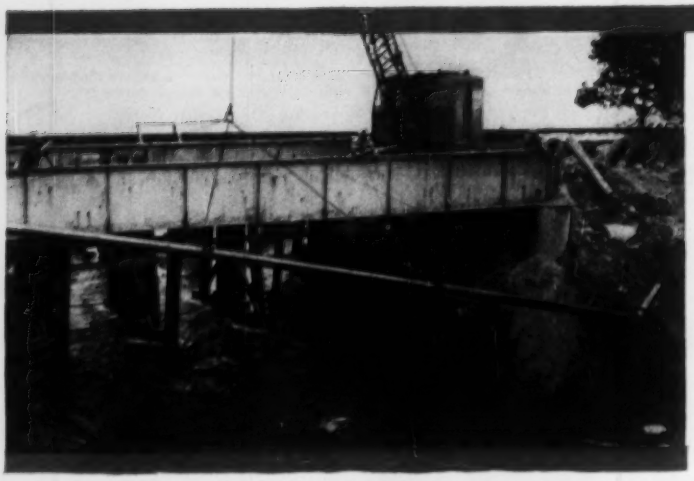
See you at the ROAD SHOW

Barber-Greene BG

AURORA, ILLINOIS, U.S.A.

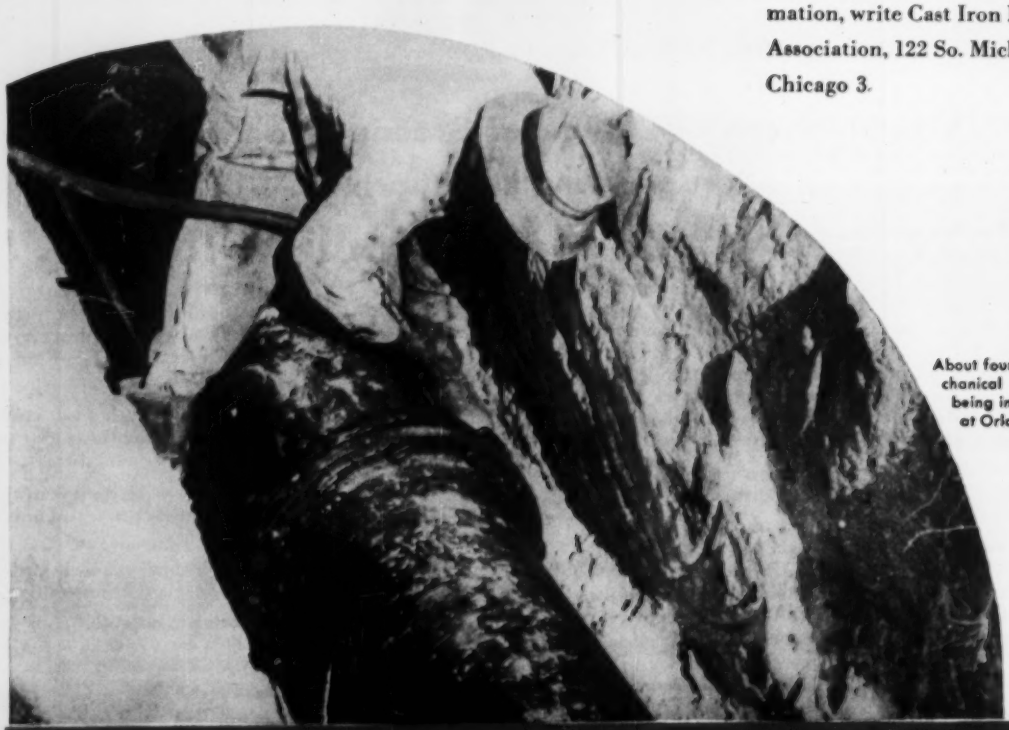
CONVEYORS...LOADERS...DITCHERS...ASPHALT PAVING EQUIPMENT

When you use it



Installing 6-inch Mechanical Joint cast iron pipe for pressure sewer river crossing to sewage treatment plant at Marquette, Mich.

If you were to put *your own money* in a pipeline that should be as nearly permanent as brains, hands and machines could make it, what pipe would you buy? Cast Iron Pipe, undoubtedly! And why? Because cast iron mains are in their *second century* of service in nearly *seventy* cities. *Modernized* cast iron pipe, as made today, is even tougher and stronger. Since everybody pays taxes, one way or another, everybody benefits when you install long-lived cast iron pipe. For further information, write Cast Iron Pipe Research Association, 122 So. Michigan Avenue, Chicago 3.



About four miles of 16-inch Mechanical Joint cast iron pipe being installed for water line at Orlando, Florida.

CAST IRON PIPE

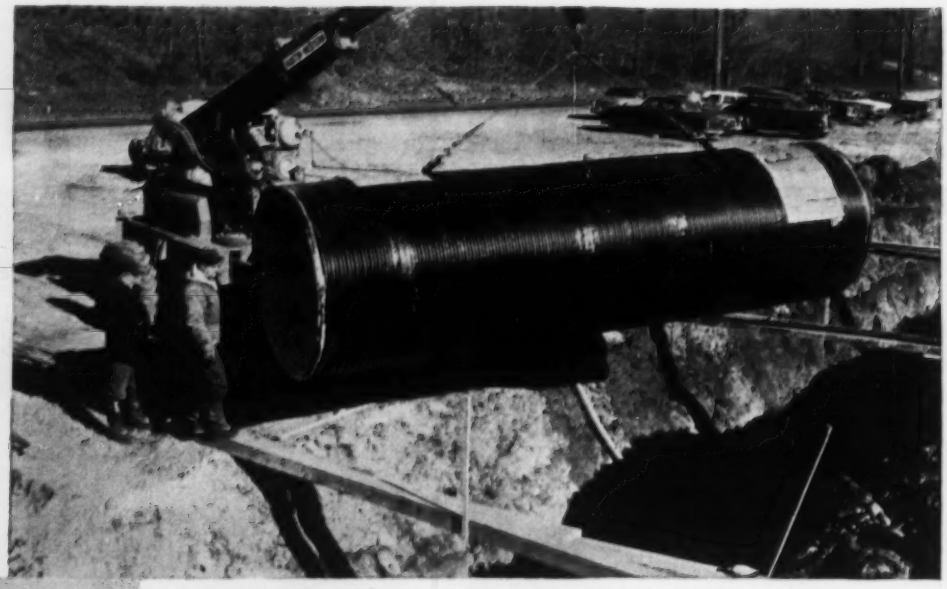
everybody benefits!

Laying 16-inch cast iron pipe for water line to new Caterpillar Tractor Company plant at Decatur, Illinois.

Tieing-in 16" Cement-lined cast iron feeder main with 133-year old cast iron water main in Philadelphia.

Laying 21,000 feet of 6" to 12" cast iron pipe for water main extension at North Brunswick Township, N. J.

SERVES FOR CENTURIES...



This Armco Sewer has served nearly a half-century and has a life expectancy of many more years.

For long life

Armco Sewer Structures give you both structural and material durability

The 346-ton wheel load of this ladle car has traveled over this 6-foot-diameter Armco Corrugated Metal Pipe several times daily for 29 years.

Armco Corrugated Metal Structures combine both material and structural durability for balanced design. Any sewer structure needs both of these durability features. One without the other is useless. If the sewer fails structurally, your investment is lost no matter how long the material lasts.

Armco corrugated metal construction features high strength with light weight. Bolted connector bands assure strong, tight joints.

With Armco Structures you can save money by specifying the degree of material durability you need for each condition. Plain galvanized Armco Pipe and Pipe-Arch are ideal for normal service. Armco Asbestos-Bonded combats severe corrosive conditions. Paved-Invert withstands highly erosive flows. And for lasting top flow capacity, you can specify Armco Smooth-Flo Sewer Pipe.

Write for data applied to your specific sewer or drainage projects. Armco Drainage & Metal Products, Inc., 4736 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

ARMCO

Sewer Structures

ENGINEERING NEWS-RECORD

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Back issues of ENGINEERING NEWS-RECORD *are generally available for the previous six months. Price 45¢ each copy except Annual Cost Issue. Semi-annual indexes will be sent on request.* ENGINEERING NEWS-RECORD *is also indexed in Industrial Arts Index and Engineering Index.*

THE CONSTRUCTION WEEK

HOW TIMES CHANGE—Looking at the $4,500 to 5,700 starting salaries of its 1956 graduates in civil and electrical engineering, Manhattan College made a comparison with first earnings of the Class of '36. Twenty years has made a difference. Those who could find engineering jobs at all in '36 went to work at $1,300 to $1,500 per year. Starting engineering salaries, therefore, have about quadrupled while the cost of living index has but doubled. Manhattan's conclusion: Young engineers today live better—and can find the work of their choosing.

EARNINGS AND SATISFACTION—The Kansas City Section of ASCE has heard from about 400 civil engineers on a questionnaire designed to determine what they earn and whether they are happy. The average respondent was about 37 years of age; average yearly earnings were found to be $9,140; mean earnings—more meaningful—were $7,000. What do they think they should be earning for what they do? The average: $10,625. Most are satisfied with civil engineering (89%) even though not afforded professional recognition (61%) by the public. More than half are concerned daily with tasks subordinates could do, and more than half rate their working conditions less than good. See ENR's Special Report on Engineering Manpower starting on page 28 of this issue.

BRAZIL HYDRO PLANS REVEALED—Look for announcement about a week from now that Brazil has worked out financial arrangements for a $300-million hydro-power project to develop 1.1 million kw in Furnas Gorge of its Rio Grande. It will be a "partnership" project with private as well as federal and state interests; Export-Import Bank financial help is being sought with apparent confidence. International Engineering Company of San Francisco has been in on early planning. Construction will be open to bidding. Details of the concrete dam to be built were not available last week, but the powerhouse is to have ten units, each 110,000 kw. Construction is expected to start early next year on a rush basis; President Kubitschek has promised to boost Brazil's 3 million kw to 5 million by 1961.

INTER-CITY SEWAGE SQUABBLE—The California cities of Manhattan Beach and Hermosa Beach have lost another round in their fight to keep Los Angeles from revamping Hyperion sewage works back to primary treatment. A Superior Court judge threw out their injunction suit on grounds that they had not exhausted administrative remedies. These they have tried (ENR May 10, p. 28)—unsuccessfully. Appeal to higher court now seems their more likely move.

As the world's tallest and most forbidding mountain peaks have at last succumbed to the determination and initiative of man, so, many of the problems encountered in pipeline installations have been overcome by the versatility of Lock Joint Concrete Pressure Pipe.

Whether it must be installed in swampland, on steep grades, in a maze of underground city utilities or in the limited confines of a plant, Lock Joint Concrete Pressure Pipe can be laid bottle-tight, rapidly and with ease; and the trench can be backfilled immediately to avoid expensive ditch maintenance.

Once laid, its qualities of durability, trouble-free service and permanent high carrying capacity will eliminate the necessity of costly re-excavation for repairs, replacement or cleaning.

Installing 78-inch Lock Joint Prestressed Embedded Cylinder Pipe for cooling system of new Tidewater oil refinery.

36-inch Lock Joint Reinforced Concrete Cylinder Pipe was installed through Florida swampland.

LOCK JOINT PIPE CO.

East Orange, New Jersey

Sales Offices: Chicago, Ill. • Columbia, S. C. • Denver, Col. • Detroit, Mich. • Hartford, Conn. • Kansas City, Mo.

Pressure • Water • Sewer • **REINFORCED CONCRETE PIPE** • Culvert • Subaqueous

WASHINGTON OBSERVER

The Air Force has won its right to use portland cement in preference to asphalt air bases. The Asphalt Institute, downed in recent tests, is trying now to mix a new batch that can get them back into the running.

Result of a competitive test at Kelly Air Force Base this summer—set up by the Air Force and the Army Engineers at the request of asphalt interests—was a smashing success for concrete. Asphalt officials admit that as things stand now, they have no argument with which to persuade the military to accept bituminous pavement for airfields on runways, taxiways and other airfield pavements.

The test compared the two types of pavement under simulated repeated loadings of heavy aircraft—a load of 100,000 lb. The concrete strip was built to military specs; asphalt design and construction were controlled by the Asphalt Institute for this test.

Test procedure called for 30,000 load repetitions of dual-wheel landing gear. The asphalt strip began to show distress at about 3,000 loadings and became so badly rutted at 9,000 loadings that the testing of the asphalt pavement was discontinued. However, at the end of 30,000 load repetitions on the concrete pavement, it showed no signs of deterioration.

•

The outcome seems to be such that the asphalt interests can't go to Congress as they did in 1954 when the Air Force tried to impose a price differential favoring portland cement concrete pavements.

The outcome then compelled the Air Force to buy on price for construction in all but the so-called critical areas—where, all sides agreed, asphalt would not stand the heat blast and fuel spillage from jet planes.

Now the Air Force has a free hand to require concrete wherever it feels it is required.

•

Bureau of Standards is now working on failure of concrete beams, particularly in rigid frame bents. This is the kind of design that has been failing dramatically in Air Force warehouses and other structures around the country.

The bureau has hired an engineer, Arthur F. Kirstein, to carry on a research project that has been inactive. Purpose: To develop information now lacking on shearing stresses and strengths to control cracking.

•

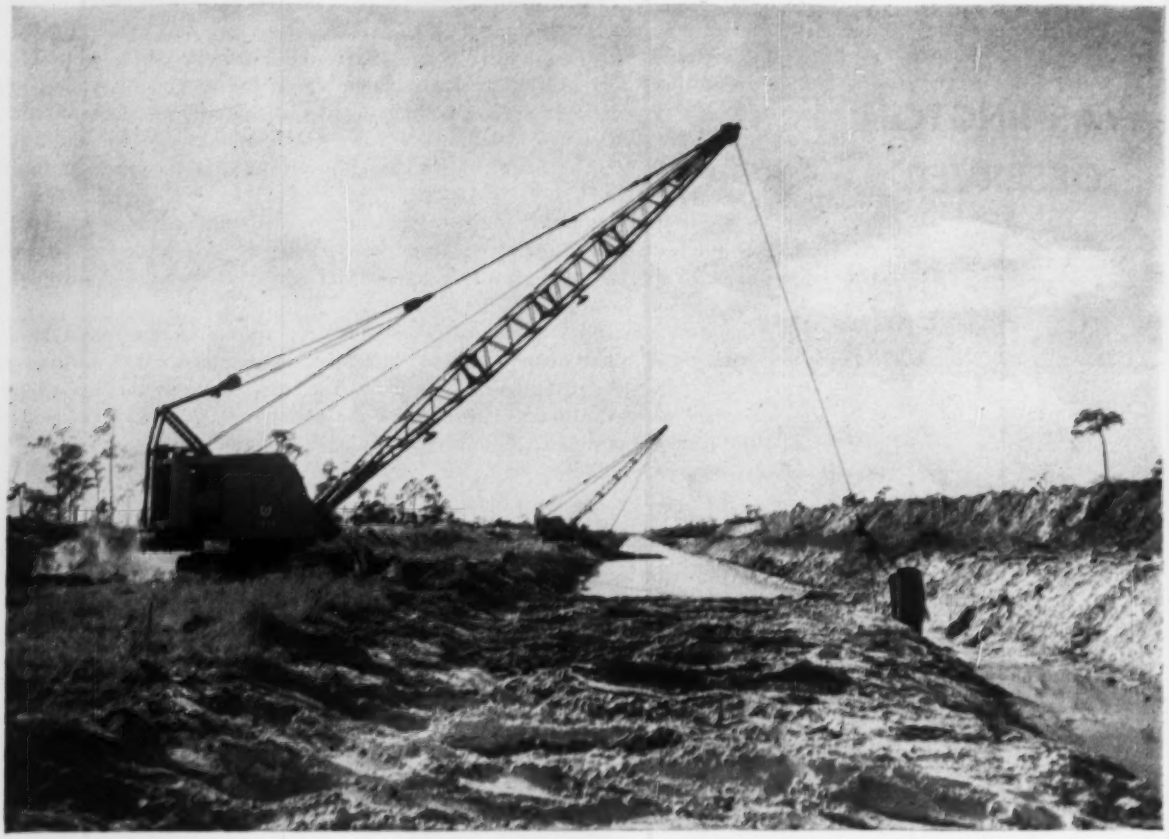
The log-jam holding back federal funds for sewage treatment plants has been broken. Eisenhower last week okayed a set of five criteria to be applied by the Surgeon-General in deciding when federal aid can be given municipalities for such projects—the so-called "propriety of federal aid criteria."

Public Health Service is now all set to act on applications for construction grants. By now, every state pollution agency is expected to have its supply of forms to distribute to city officials. Once a city gets approval of the state agency on its need for pollution control and need for the money, the application goes to the PHS to be checked out against the criteria just now established.

The criteria are not unduly restricted—A project must be needed to control pollution of interstate, coastal or Great Lakes waters; or to meet an international treaty requirement; or to protect a federal installation or program; or to abate a serious health hazard; or to offset an "extraordinary and excessive financial burden" on the community if it went ahead without federal aid.

The test of "financial burden" criterion is figured to be one that will be used to approve a grant for an applicant whose case is no better than other applicants under the other four criteria. But in this test, state certification is expected to prevail.

It's time to compare... with LINK-BELT SPEEDER



As a dragline, shovel, hoe or crane a Link-Belt Speeder provides new opportunities to step up production schedules and profits. No other machine can touch it for fast, effortless control . . . easily responsive brute power . . . stamina and low maintenance.

New way to measure shovel-crane efficiency

Link-Belt Speeder completely revises existing production standards. It's the only line with true power-hydraulic controls, up to 40% more usable hp!

With competition getting rougher, can you afford to think in terms of outdated production standards? If you aren't using a Link-Belt Speeder —it's hard to realize just how much more production . . . more usable net horsepower these new shovels, cranes and hoes offer.

Speed-o-Matic power hydraulic controls—a Link-Belt Speeder exclusive—make every move fast, sure, easy. With them, you can boost output —often as much as 25% or more!

From track treads to boom tip

. . . every detail of a Link-Belt Speeder reflects advanced engineering, skilled craftsmanship, precision construction and quality materials.

Check this list of a few standard and optional features—independent swing and travel . . . independent rapid boomhoist . . . torque converter . . . third drum . . . reversing clutches for both hoist drums . . . and hydraulic-actuated swing brake.

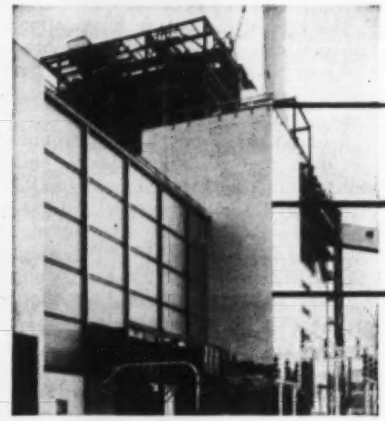
It's good business to *compare now!* See why more and more Link-Belt Speeder owners have completely revised their thinking on how fast a job will go. Your distributor will be pleased to arrange for you to see a new Link-Belt Speeder in action, give you the facts. Call him now! Link-Belt Speeder Corporation, Cedar Rapids, Iowa.

14,250-A

LINK-BELT SPEEDER

Builders of a complete line of shovel-cranes . . . with exclusive Speed-o-Matic power hydraulic controls

The 1956 Industrial Building Boom:



It's Already the Biggest Year on Record —Awards Should Hit $5.1 Billion

It Has a $16.5 Billion Backlog of Proposed Work to Keep It Going

It Sets the Stage For Still Another Boom Year in 1957

The Topping-out Is Not Yet in Sight

Industrial building has sprouted faster this year than anything since Jack's fabled beanstalk.

With two months to go, industrial building awards, as reported by ENGINEERING NEWS-RECORD and CONSTRUCTION DAILY, already are far ahead of any full year on record.

October's contribution of $377 million pushed the 10-month total to more than $4.5 billion. When the November and December figures come in, the total for the year should be a monumental $5.1 billion—or more.

To get these figures in perspective, it's worth comparing the first nine months of 1956 with the same period in 1955, which was considered an unusually good year for industrial building.

From January through September last year, industrial contracts totaled just over $2 billion. For the same period this year, the total was better than $4.1 billion—up 102%.

Until this year, the highest dollar volume posted for industrial building was in 1951 when the forced-draft expansion of defense industries sent the total for industrial projects to an unprecedented $4.1 billion.

Steel industry expansion played a big role in the 1951 record. It is an important factor this year in breaking the old record, and it will continue to be a potent force in the next few years.

Just how important the steel industry has been this year in the industrial building field becomes clear in an analysis of ENR-CD reports of industrial contracts in the first nine months.

At the end of the third quarter, the metal refining and rolling category accounted for a total of $807.2 million in awards. That was up 688% over the same period in 1955.

But even with this tremendous spurt, this industrial category trails two other major groups in the sometimes hectic 1956 expansion race.

The process industries, with a strong assist from the fast-growing aluminum field, led the pack at the end of the third quarter with a total of $1,326 million in contract awards, up 76% over the comparable 1955 period.

Second spot for the same period went to the public utilities, whose nine-month total of $860.6 million represented an 81% increase over 1955.

Other industries, while beating smaller drums, joined the biggest expansion parade in U.S. history.

Among those categories whose dollar volume of industrial building marched ahead of last year were: machinery and parts, automobile, general industry, aircraft, food, wood, railroad, foundry and refrigeration and cold storage.

• More to Come

The end of this boom is not yet in sight. Industry needs more capacity. As a general rule, industry on the average likes to operate at about 89% of capacity. But, it's actually operating at about 92%. And, with sales continuing to rise, there's a note of urgency in some of the expansion.

Some industries, such as steel, which have been operating at or close to 100% capacity, have not been able to keep up even with current demand. And, these industries already are making plans for some eye-popping building programs.

These proposed projects have swelled the ENR backlog, which, at the end of October had risen to nearly $16.6 billion for industrial building. It has risen $2.3 billion in the first 10 months of this year.

Another element in the mounting backlog of proposed industrial projects is the movement of industry to the South and West.

Because of this geographical switch, it is not surprising that Texas has the biggest backlog of proposed industrial building. At the end of October, Texas had nearly $2.6 billion worth of industrial projects in the planning stage.

The Midwest also is shaping up as an enormous market for industrial builders. Ohio, for example, has the nation's second biggest volume of proposed work—$1.3 billion. Other states in the Midwest are up near the top of the list.

While third place goes to Pennsylvania (a Middle Atlantic state), Missouri is in fourth place, Indiana has the No. 5 spot and Illinois is sixth in the dollar value of proposed industrial work.

Pennsylvania industries have $910.2 million worth of work in the proposed stage. Missouri follows with $899.5 million; Indiana, $881.4 million; and Illinois, $873.6 million.

(Continued on page 22)

Timetable for the Industrial Boom

JANUARY **Industrial building contracts totaled $259.2 million, 13% over January '55 and the best January for this type of work since 1953.**

FEBRUARY **. . . Industrial building awards jumped 45% ahead of January to $377 million. That total was 210% over the comparable industrial building figure for February 1955.**

MARCH **Contracts hit $728.2 million, helped to pile up an impressive first quarter, which zoomed 163% ahead of 1955.**

APRIL **April added another $558 million in industrial building awards to the already-bulging total, industrial building has grown so rapidly this year that it is now head and shoulders above all other categories in its gains over 1955, running 147% above the comparable 1955 period.**

MAY **With more than $2.5 billion in awards for the first five months of this year, industrial building is 139% ahead of the comparable 1955 period—and it continues to be a potent factor in the boom.**

JUNE **Industrial building, which fell off 33% from its pace-setting record in May, is still ahead of its June 1955 rate by 80%.**

JULY **As in previous months, industrial building awards set the pace in the private construction field. During the month of July, industrial building awards climbed to $642 million, more than doubling the June figure and soaring 85% above the total set in July 1955.**

AUGUST **While awards were down 62% from July, they were still 4% above August 1955. And, the eight-month total . . . is a fabulous 101% ahead of last year.**

SEPTEMBER **Industrial building contracts bounced back from their August slump to average $90 million a week, more than double the September 1955 rate.**

OCTOBER **. . . Total for the month was $377 million, 5% ahead of September, and 31% ahead of October 1955 . . . the 10-month total is $4.5 billion.**

• Friendly Persuasion

One of the most interesting sidelights in this year's boom has been the widespread trend toward state and community industrial development corporations which generally have one goal —to persuade industry to build a new plant in a certain area.

In other times, site-seeking representatives of a company were greeted cooly by many communities. Now the welcome is warm, and the site-seers are being welcomed in town, in some cases by invitation.

The industrial development corporations, whether at the state or local level, offer a wide variety of services and incentives to industry. It is too early to tell precisely how much of the present industrial building boom has been generated by these groups. But it seems reasonable that the aggressive selling campaigns by some states and communities have persuaded businessmen in borderline cases to build now.

While an ENR survey earlier this year showed that business is less interested in inducements such as free sites than it is in the community attitude toward business, (reflected in zoning, taxes, buillding codes) financial incentives may become more important if the tight money market continues.

Some states already are playing the financing theme heavily, and others will shortly. Pennsylvania, for example, has worked out a much-publicized plan that enables a manufacturer to invest a minimum amount of capital in a new plant. Local groups, through subscription, raise 20% of a project's cost. The state industrial corporation will take a second mortgage for up to 30% of the cost of the building, leaving only 50% of the total to be handled by local banks through a first mortgage. Other states, such as Kentucky, Tennessee and Alabama, sell bond issues to finance such projects.

Application of Fluoridation Picks Up Sharply This Year

The U. S. Public Health Service reports a sharp rise in the number of people drinking fluoridated water. During the first nine months of 1956 communities with a combined population of 6 million started using fluoridated water.

The rate of increase in fluoridation's application is double that of the previous four years when PHS recorded an annual increase of 4 million persons drinking fluoridated water.

By Sept. 30 about 1,400 communities with over 30 million people were using fluoridated water compared to 924 cities with 1.5 million people at the end of 1950. Larger cities are the main users. At the end of 1955, PHS records showed that half the communities with over 500,000 population and one-fourth of those with a population between 10,000 and 500,000 were adding the tooth decay preventive to their water supply. But only 5% of the towns with under 10,000 population were fluoridating at the time.

Who's to Run Sewerage System? A Controversy in Columbus

The metropolitan area centering in Columbus, Ohio, is almost certain it wants a single sewerage system but can't agree as to who should run it—the City of Columbus or an independent authority. The disagreement threatens to result in a rash of individual sewage disposals systems since several surrounding towns already have either approved preliminary plans or are working on them.

Outside users of the present City of Columbus system object to continuance of a use rate higher than that which city dwellers pay under a metropolitan scheme. The City, on the other hand, doesn't want to suffer from higher per capita costs entailed in constructing countywide facilities.

Fearing that a multiplicity of sewerage systems will set the area back considerably, the non-Political Development Committee for Greater Columbus has stepped into the controversary in an attempt to work out amicable administrative procedures.

Ohio Sells Another Segment Of 500-Million Bond Issue

The Ohio Sinking Fund Commission sold a $25-million segment of the $500-million state highway bond issue approved by voters in November 1953.

A syndicate headed by Blyth & Co., New York, won the issue on a bid calling for an effective interest rate of 3.11%.

The latest sale brought to $157

million the total sold under the three-year-old program to improve the state's major highways. The funds can be used to match federal funds that will be allocated to Ohio under the new federal-aid highway program.

Interest costs have climbed since the first $30-million issue was sold in October 1954 with an effective interest rate of 1.38%. But, members of the commission were satisfied with the Blyth bid in view of the current "tight money" situation.

Of the $175 million in bonds already issued, $7.9 million worth of bonds have been retired from proceeds of an extra one cent per gallon tax on gasoline and receipts from the state axle-mile tax on trucks.

Washington State PUDs Propose Joint Projects

Establishment of a joint operating agency for generation and transmission of power in the State of Washington is proposed by 17 Public Utility Districts in an application filed with the State Director of Conservation and Development.

Approval is likely, under a state law authorizing PUDs to pool their operations.

The law was enacted in 1953, modified in 1955 and upheld last month in a county superior court. It gives the PUDs virtually the same powers held by the State Power Commission in acquiring or building generating facilities and in production and selling of energy.

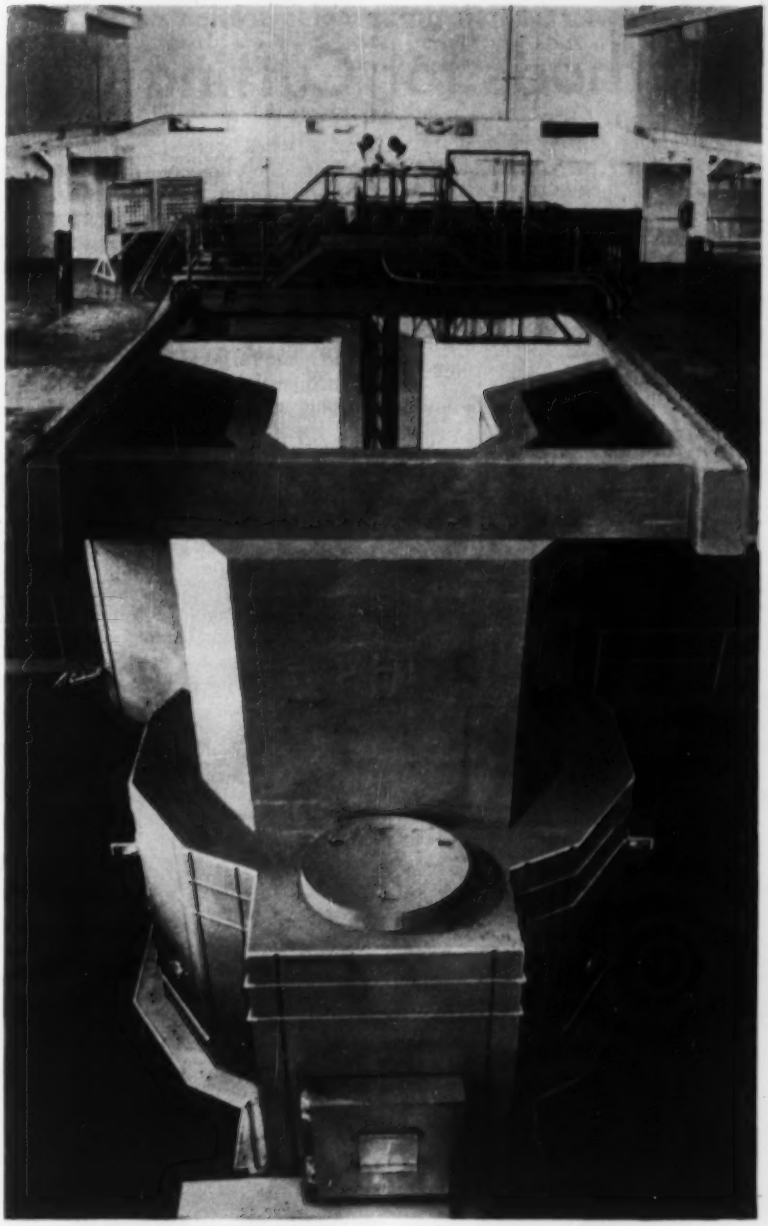
The proposed agency plans to build five power plants capable of a total of 243,000 kw. Largest project would be a 200,000-kw steam plant, which will be constructed at a location yet to be selected. The others would be small hydroelectric projects.

The steam plant would be built near transmission lines of the Bonneville Power Administration and would burn either fuel oil, natural gas or pulverized coal. The PUDs also propose a substation and a 230-kv transmission line.

Supreme Court Draws the Line Between an Act and Omission

The North Carolina Supreme Court holds that failure by the State Highway Commission to repair a hole in a road does not constitute a negligent act, and therefore, the commission is not liable for damages when there are claims that the hole was the cause of a fatal accident.

The decision came in a suit in which the plaintiff sued for compensation for the death of a son under a law that allows persons injured as a result of negligent acts of state employees to sue the state.



Large Pool Reactor Finished

A 1,000-kw nuclear reactor has been completed at Battelle Institute, Columbus, Ohio, at a cost of $770,000. The largest of the swimming-pool type to be put into service in the U.S., this research unit is the third major addition to the nation's first privately owned nuclear research center in 13 months. Laboratories for radiation studies and reactor development preceded it.

The reactor, which will permit experiments on materials under many conditions of temperature and pressure with neutrons and gamma rays present, is housed in a 3-story 72x100-ft building.

The two-section, water-filled pool in which the reactor core is suspended is 20x40 ft by 28 ft deep. The core, composed of fuel elements and boron control rods, occupies a space 1x1.5 ft by 2 ft deep at the bottom of a latticed member suspended from the movable control bridge atop the pool. Barytes concrete 6 ft thick enclosing the reactor supplements demineralized water in the pool as a shield.

The construction contract was held by American Machine & Foundry Co.

Homebuilders research group holds session on . . .

Methods for Cutting Costs on Homes of

Homebuilders putting up modest-size houses of 1,000-1,100-sq ft floor area can pare their construction costs some $200 per dwelling by employing two simple but not-yet-generally-adopted techniques:

• Use grade beams instead of continuous deep footings to support basement (or crawl-space) walls, at a saving of $125 per house.

• Place concrete continuously and monolithically in footings, grade beams and basement walls, thereby cutting costs by as much as $100 per dwelling, in comparison with the traditional method of placing foundations, basement walls and cellar floor in three separate operations.

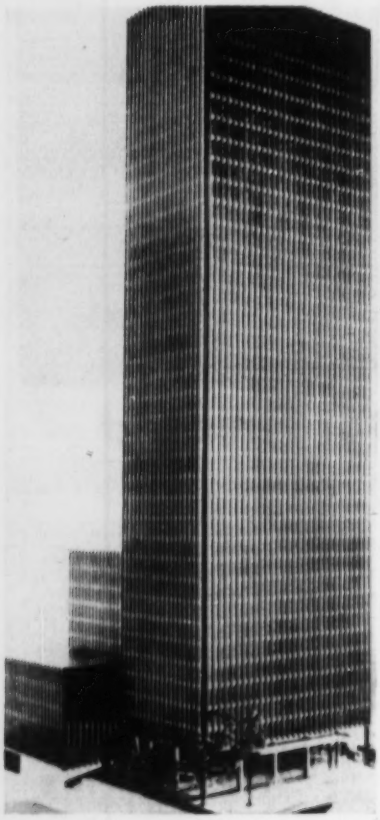
These are tangible and readily achievable dollar savings that came out in last week's cost-cutting conference at the National Housing Center in Washington, D. C. The Research Institute of the National Association of Home Builders stage-managed the two-day meeting for the Housing Center, which sponsored the show.

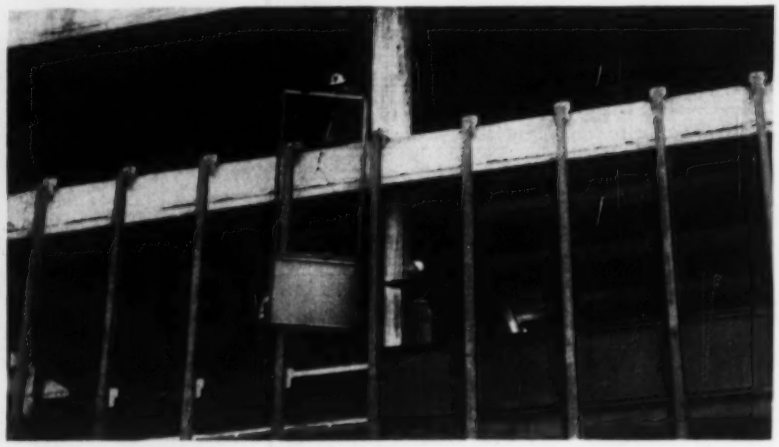
Potential savings of even greater magnitude, but without definite dollar figures attached, were trotted out for the benefit of 60 homebuilders, architects, engineers and prefab manufacturers who attended. These larger potentials are related to factory or job fabrication of roof and wall assemblies, to local adoption of the new American Standard for Plumbing A-40.8 (successor to the outmoded National Plumbing Code) as a basic guide for local regulations, and to reduction of residential street widths in keeping with actual traffic requirements and lessened hazards for neighborhood children.

Beyond these, of course, are even greater savings that can be obtained by wise site planning. Land costs are the biggest and fastest-growing single item in the expenditure schedule of homebuilders today. Much wasteful land planning and grading can be eliminated if builders employ competent specialists who understand the real intent of government property regulations, the meeting was told. As exemplified by the new FHA Minimum Property Requirements Revision No. 56 that came off the presses two weeks ago, federal standards allow wide latitude and flexibility in site development, quite diffent from the "scraped earth" policy that many builders and some FHA field offices have up to now read into superseded MPR Revision No. 36.

• **Tilt-up construction**—No definitive cost-reduction estimates were offered for the 1,000-1,100 sq ft house through use of relatively new fabrication methods employing tilt-up walls and roof trusses. Builders at the conference emphasized the size of the savings, however. Some builders said they had made savings of $65 per dwelling by using prefabricated trusses instead of conventional roof framing, while others had figures on cost reductions up to $200 per house through use of tilt-up walls in place of the old piece-by-piece erection process. Most of the components in large wall assemblies for tilt-up construction are put together on the floor in a nailed and bonded unit, ready for raising into position.

Another big saving that many builders are missing ties back to the skill and competence of the construction management in their organizations, the con-





First Bronze Panels Are Placed

General Bronze Corp. last week began installing the bronze panels that will form the exterior facing of the 38-story Seagram Building in New York City.

As can be seen from the photo of a model (left) the panels are placed between vertical extruded-bronze mullions that extend the full height of the building. The 6x4½-in. I-shaped mullions serve also as guides for window-washing equipment.

The panels are 4 ft 7 in. wide and one-story high. They contain spandrels about 4 ft high and ¼ in. thick. Glazing, which will be fixed because the building is air conditioned, will be installed later, as will a fire-resistant masonry backup.

The alloy used consists of copper 56%, zinc 41.5%, lead 2.5%.

The Seagram Building was designed by Mies van der Rohe and Philip Johnson, with Kahn & Jacobs as associate architects. George A. Fuller Co. is the general contractor.

Medium Size

ferees agreed. With a good manager and superintendent in charge of homebuilding, added efficiency gained through pre-planning of operations, prescheduling of materials and simplification of work can make a difference of $350 per 1,000-1,100-sq ft dwelling in a housing development.

• **Electrical costs to go up**—Builders at the cost-cutting conference howled dismally when electrical engineer R. L. Lloyd of the National Bureau of Standards told them that new changes in the National Electrical Code will result in pushing home costs further upward instead of down.

The new requirements call for 100-amp three-wire service, recognize use of aluminum wire for distribution feeder service and power transmission cable only, give general recognition to snap switches for AC systems, and recommend 12-ft spacing of wall outlets. It is estimated that these changes will increase construction cost about $75 for a modest-size home.

By contrast, local adoption of the new provisions of the American Standard for Plumbing (A-40.8), plus prefabbing of components, etc., can cut the cost of the same house up to $200.

Alan Brockbank, Salt Lake homebuilder, was general chairman of the meeting, and Andrew Place, South Bend builder, was technical chairman. Place and his Indiana colleagues reported they had saved up to $125 per home on thousands of houses by using grade beams instead of continuous footings under the basement walls. Joe Goldman of American Community Builders, Park Forest, Ill., similarly reported cost reduction of $100 per house in a 2,000-home development by placing basement floors and footings in one operation.

School Roof Collapse Held a Bearing Failure

A preponderance of evidence points to the probability of a bearing failure as being responsible for the collapse of a prestressed concrete roof in the Blankner Elementary School, Orlando, Fla., last September. So reports an investigating committee of the Central Florida Chapter of the Florida Engineering Society.

The committee believes that the stems of the prestressed concrete T-beams gave way or the supporting tie beam (bone beam) atop the 8-in. concrete block wall or both. However, a more thorough investigation would be desirable, the committee says.

The 56-ft pretensioned T-beams spanned a one-week-old cafetorium. The collapse occurred in the early morning hours of Aug. 31 during a rainstorm (ENR Sept. 20, p. 27).

A report issued last month by the Prestressed Concrete Institute stated that the principal cause of the collapse was an accumulation of water on the deflected roof deck but gave no indication of the probable nature of the failure (ENR Oct. 18, p. 27).

Annual Award To Be Given For Engineering Research

A new award in engineering education, in recognition of accomplishments and research potential of young engineering research workers at a college or university, will be given for the first time next June.

The annual award, administered by the Engineering College Research Council of the American Society for Engineering Education is sponsored by the McGraw-Hill Book Co. and will include a $1,000 cash prize.

Officially the Curtis W. McGraw Research Award, it was established in memory of the late Curtis W. McGraw, president of McGraw-Hill from 1950 to 1953.

Candidates must be young men "who have made original contribution in engineering research and who have demonstrated high potential for future leadership."

The first presentation of the award will be at the 1957 ASEE meeting at Cornell University in June.

Nominations should be sent to Dean James R. Cudworth of the University of Alabama not later than Feb. 1, 1957.

Thin Panels Curtain Five-Story Building

STEEL PANELS incorporate inside and outside wall finish plus insulation.

Steel sandwich panels—over 1,000 of them, totaling 61,000 sq ft in area—comprise all four walls of U. S. Steel Corp.'s five-story office building now nearing completion at the Homestead District Works, Munhall, Pa.

Faced on one side with cold-rolled carbon steel sheet and on the other with either fluted stainless steel or porcelain enamel, the 4½ x 12-ft panels require no additional finish either inside or outside the building. Insulating cores of glass fiber 1¼ in. thick separate the inside and outside facings. Windows in the 331 x 72-ft building are completely reversible on vertical pivots. Floor area is 120,000 sq ft.

Personnel of the Homestead Works are scheduled to move next March. Under construction by Crump, Inc., of Pittsburgh, the building was designed by Hoffman & Crumpton, Pittsburgh architects.

Early Start for Feather River Job

• Funds to be asked for $1.6-billion water project

• Official ok to be asked for California Water Plan

• Financing plans in works water group is told

Spring start possible.

Statewide plan needed.

Actual construction of elements of California's $1.6-billion Feather River Project may well start early next spring, according to Harvey O. Banks, Director of California's Department of Water Resources.

Banks made this prediction in a speech that was part of a full-day's session devoted to California's $11.3-billion Water Plan (ENR May 17, p. 27), local, state and federal officials participating. Occasion was the meeting late last month of the California Section of the American Water Works Association. As head of California's new Department of Water Resources—organized to give the state a water construction agency—Banks will have the job of placing the plan in operation.

Banks' agency will request an urgency appropriation of the state legislature for beginning of Feather River Project construction. This appropriation, if made in January, would permit construction to start on relocation of highway and railroad facilities by early spring.

Banks outlined other action necessary from the legislature. Among other things, he will ask for legal sanction of the California Water Plan as the master plan for California's future water development. And he will seek a plan for financing of state projects as well as for state participation in local projects where there is a state-wide interest.

The session was moderated by Samuel B. Morris, former chief engineer and general manager of the Los Angeles Department of Water & Power. Morris explained that the water problem in California is as large as it is since Southern California contains nearly one half the population and assessed valuation of the state, while the only surplus waters of the state exist north of San Francisco. Large storage facilities and aqueducts are needed to bring water from its source to the south.

• **Financing**—Much attention was devoted to financing the California Water Plan. State Assemblyman Bruce Allen of San Jose, urged that financing be on a pay-as-you-go basis.

Allen's pay-as-you-go proposal is in sharp contrast to previous suggestions. The Feather River Project, as originally outlined, contemplated financing by general obligation bonds. In Harvey Banks' talk, he indicated that his agency anticipated a considerable part of the cost would be born out of current revenues. But he also said that a general obligation bond issue to supplement available current revenues will no doubt be necessary.

• **Local participation**—A plea that local agencies be permitted to finance and construct their own facilities was made by John W. McFarland, general manager of the East Bay Municipal Utility District. On the other hand, McFarland pointed out that there may be instances where local agencies will need state help.

In this regard, Banks indicated that he would propose to the legislature a program whereby the state would participate financially in locally built and locally operated projects to the extent of the state interest. And he also pointed out it may be advantageous to the state to establish a water-development loan fund to help local agencies meet the needs of their service areas.

• **Federal participation**—California's Lt. Governor Harold J. Powers urged that the state seek all federal aid possible within the framework of existing law, and the California Water Plan. But both Lt. Governor Powers and Assemblyman Allen said that the state cannot afford to wait for federal action. Speakers agreed California's need seemed to justify immediate state action.

Bureau of Reclamation's Regional Director Clyde Spencer said, "it's unimportant who builds what in California, but it's damned important they get built."

Both Spencer and Brig. Gen. William F. Cassidy the Corps of Engineers South Pacific Division Engineer, pledged their agencies to work within the framework of the California Water Plan as it develops.

In this regard, Banks emphasized that the California Water Plan, as originally brought out some months ago, was only a tentative program. A more finalized version will be submitted to the legislature in February, but even this will be subject to constant review and change.

In a business session later in the meeting the group—California's AWWA section—passed a lengthy resolution supporting in principle the California Water Plan.

This resolution is but one evidence that the plan has widespread support. And it is also obvious there is a real sense of urgency about getting started on the scheme.

For a Big Thirst

Solar still will be built for seawater in San Diego

A pilot seawater conversion plant may be operating in the San Diego area within three months according to Willis T. Moran, chief chemical engineer for the U.S. Bureau of Reclamation.

The San Diego City Council has given unanimous approval to using a 4.9-acre site at Ocean Beach south of the Mission Bay entrance channel for an experimental seawater conversion plant. A bill introduced this year in Congress authorized San Diego as the site for such a plant.

A lease will be drafted and submitted to Washington, D. C., for inspection by David Jenkins, director of the Interior Department's salt water conversion program. If approved, it will be submitted to the San Diego City Council for final approval. Construction will take about six weeks once the lease is signed.

The plant is expected to produce 500 gpd of fresh water. The installation would consist of a series of saucer-shaped concrete slabs covered with glass, constituting a solar still, a greenhouse-like structure to convert salt water into fresh water. Water pumped under the glass would be condensed by the sun's rays shinning through the glass.

They Didn't Build It

Huntington gets in trouble over sewage treatment plant

The West Virginia Water Commission last week cited the City of Huntington for failure to comply with its May orders to start construction of a $10-million sewage treatment plant.

Under the law, the city may be named in an injunction action by the State Attorney General and fined—itself and each member of the City Council $100 a day individually—for each day of failure to comply with the commission's order.

Last May the commission ordered the city to have contracts awarded on part of the work by Oct. 1. It also directed the city to make arrangement for financing the project. As of last week Huntington had neither arranged for financing nor advertised for bids on the contract.

Early in 1955 the Water Commission tried to prosecute the Mayor and City Council for failure to comply with its orders. However, a Huntington grand jury refused to indict them.

The Huntington Sanitary Board is collecting sewage service charges to finance the project. But there is not enough money on hand as yet to begin construction and the present Mayor has said that he opposes a bond issue to finance the project.

Across-the-Board Pay Raise Sought for Road Department

The North Carolina State Highway Employees Association has called for a 15% across-the-board pay increase for highway department employees. Meeting at Asheville, the group voted to ask the state legislature to grant the uniform pay increase.

At the same time it voted to ask the highway commission to set up engineering scholarships for children of highway department employees.

Two years ago—before the last biennial session of the state legislature—the group made an unprecedented gesture of going on public record not to ask for salary increases because of the state's financial condition. The last general salary increase was made by the 1953 legislature.

Cloud Seeding Is Rejected By the Denver Water Board

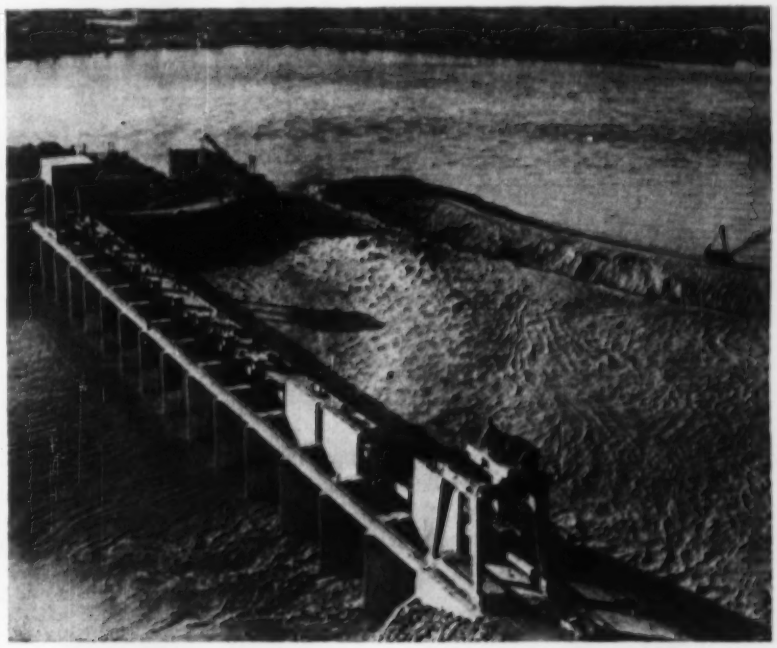
The Denver Water Board has rejected two proposals for cloud seeding after investigation by its engineering staff.

The board accepted its engineers' recommendation that no expenditures for cloud seeding should be made until "disinterested, non-commercial concerns" make more detailed appraisals of the results of cloud seeding.

The offers were made by Irving P. Krick and Pure & Applied Science, Inc., both of Denver.

The Denver Water Board had been participating with other water users in a Krick cloud-seeding project in the South Platte River Basin since 1951. But it ceased this activity last year.

Krick claimed the winter-time-only cloud seeding project in that area projected 20,000 additional acre-ft of water for the area each year. He proposed a $50,000-a-year, five-year contract. Pure & Applied Science proposed to negotiate its contract terms if the board had decided to resume cloud seeding.



Pushing the Mighty St. Lawrence Around

It was actually a preliminary to the main event which will be diversion of the St. Lawrence at Long Sault, but this partial diversion of the river's flow, upstream at Iroquois Control Dam was rather spectacular nonetheless. Flooding of a completed portion of the dam near Iroquois, Ontario, was accomplished Oct. 23. Photo from the U.S. shore shows the downstream cofferdam breached and the completed length of structure, 15 gates, flooded. With breaching of the upstream cofferdam (not shown) a portion of the river will flow through the dam. Extension of cofferdams farther into midstream will permit construction of the next length of the dam. The big diversion downstream (ENR Oct. 8, p. 30) at Long Sault Dam is yet to come.

- **What do we know about it?**
- **What can we do about it?**

Engineering Manpower Problem in Construction

There is a shortage of engineers. Everybody says so.

But everybody talks of engineers in general, and in big broad figures of college enrollments, industrial growth and population. Of course, you've got to start someplace, and those big, overall figures are generally available, fairly dependable. But can you pin the engineering manpower situation down for a given branch of engineering, a given industry dependent on engineers?

Can you consider that the construction industry is largely the field of civil engineering—some electricals, some mechanicals, some chemicals, but chiefly civils—then focus on some really definite figures for supply, for demand?

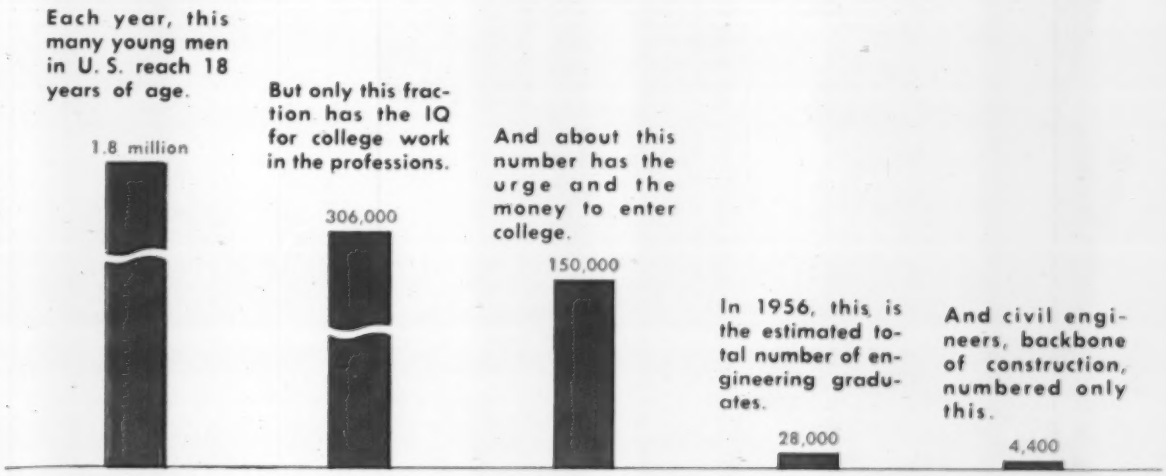
Then, if there is an apparent shortage of engineering manpower in this field, what is its effect, its extent, its probable duration?

And finally, what can be done—right now and over the long haul to alleviate present manpower problems, to obviate future manpower problems?

To find answers to these questions ENR editorial research and reporting staffs for some weeks have been talking to manpower experts, personnel managers, educators, employers of engineers and engineers themselves, of all types, in the construction field. The result of this effort is the special report on engineering manpower in construction which follows.

Here's what the findings show ● ● ● ● ● ●

Situation ...The Supply is Limited


Each year, this many young men in U. S. reach 18 years of age.
1.8 million
But only this fraction has the IQ for college work in the professions.
306,000
And about this number has the urge and the money to enter college.
150,000
In 1956, this is the estimated total number of engineering graduates.
28,000
And civil engineers, backbone of construction, numbered only this.
4,400

But CE Grads Are Not the Whole Story

Today there are over 120,000 employed civil engineers, and the construction industry is clamoring for more.

Prime sources of the additional manpower sought are the engineering schools, which last June produced only 4,400 new CE graduates (ENR June 2, p. 21).

The number 4,400 will grow, fortunately, as the effect of current increased enrollments in colleges and universities is realized in the years just ahead. But the 4,400 is actually a pitifully small number of civil engineering graduates when viewed against the total potential brainpower of this nation.

The big picture is this:

Some 1,800,000 young men reach the age of 18 each year (and about as many young women). Of this group of 1,800,000, 17% are capable of an AGCT score (Army General Classification Test) of 120 or above. This is an intelligence rating some have indicated as necessary—or at least desirable—to complete college training in the professions.

In other words, 306,000 young men each year have the capabilities to become professionals—engineers, doctors, lawyers, teachers, statesmen. But, only half of this group enter college. And only half of those who enter, graduate.

This means that three out of four of the most highly qualified young men do not get to be college graduates. Be it lack of motivation, financial difficulties, inadequate secondary school preparation, improper guidance, indifference or resentment toward the professions among parents or teachers. Whatever the reason, for every male college graduate we get, there are three potential talents gone astray.

This takes no account of women graduating from colleges—over 124,000 each year. Thousands of them are capable of acquiring an engineering education, but few are advised that this is a profession open to women. Tradition, lack of guidance, plus an apparent tendency (in many instances) to relegate them to sub-professional and dead-end jobs are among the factors responsible for the small number of female engineers. Women in civil engineering number 1,932—less than 1% of the total force.

• **Future college output**—College attendance will swing up rapidly from now on. Student enrollments reached a new peak of about three million this school year, and if the present trend continues, there will be a total college population of 4,550,000 is predicted by 1969. Of this number, about 11%, or 501,000, are expected in engineering.

Basic factor underlying the upsurge now started is the growth of school-age population. Increase in births in the late Thirties and early in World War II—followed by a phenomenal postwar rise in births—will result in a steady increase in the number of eighteen-year-olds. The proportion of young people who go to college is also rising; it has jumped from 15 per 100 in 1940 to 34 per 100 in 1956.

However, a larger college enrollment will not automatically ease the engineering shortage. As the population grows, the number of engineers needed will also increase proportionately. A greater *percentage* as well as a greater *number* of technical graduates must be supplied. The percentage of bachelors degrees in all fields of engineering as compared to all bachelors degrees is going up; engineering graduates accounted for 12% of all male graduates in 1955. But the percentage of civil engineering degrees as compared to all engineering degrees is constantly declining; civil engineers accounted for only 17% of all engineering graduates in 1955. Moreover, the proportion of undergraduates enrolled in civil engineering is steadily declining; that is to say, curricula in the electrical and mechanical fields are attracting proportionately more and more of our young men.

• **Supply at the technician level**—Employment of technicians remains mostly a haphazard affair in civil engineering and construction. Training of technicians (draftsmen, surveyors, etc.) in the past has been largely a personal matter determined by the needs of the individual employer, the company, the public agency. Now, there are educa-

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tional institutions specifically geared to turn out sub-professional people, who possess both engineering knowledge and manual skills for construction.

Such technical institutes are a recent development. The number of construction technology graduates is small (749 in 1955), but the potential for growth is tremendous, although indeterminate at this early stage of development. It will depend largely on acceptance of the institutes as a significant source of manpower for construction. The subject is treated in more detail farther on in this report.

Sub-professionals still enter civil engineering and construction by other means: company-in-service-training programs, technical high school education, correspondence school courses, drafting schools, or by working their way up from the bottom into semi-technical positions without formal training of any sort. Such sources have not produced enough sub-professional personnel.

Many public agencies are training high school graduates who can handle sub-professional work to be done in construction. In addition, companies are endeavoring to recruit young people with a year or two of college from the thousands who do not complete work for an engineering degree.

• **Experienced hands**—Lastly, there are these sources of experienced personnel: older men; those in early retirement, and men who have left the field.

There are a substantial number of engineers over the age of 50 who are having difficulty finding jobs. The Engineering Societies employment agency claims it has a wealth of talent in older men it cannot place.

And from Florida come reports that a number of companies have opened offices in that area to use retired engineers—even on a part-time basis.

Evidence of the large number of engineers leaving the field is found in a recent Carnegie Tech survey of 18,000 alumni; only one-fourth listed their occupations as anything definitely identified as engineering.

• **Seasonal help**—College students can be employed for the summer. This serves a double function; help on necessary work is gained during the construction season, and the employer has an opportunity to introduce himself to a potential future employee.

High school and college teachers too are available for summer work. Here again public relations can be combined with the job.

Demand

...Is basic for engineering teachers
...Could become critical for designers
...Is growing for engineers in contracting

Demand for manpower in civil engineering and the construction industry is great. But except in the public agencies, it is not so acute as general figures for all engineering would indicate.

A recent survey by the Associated General Contractors of America indicates that 6,500 member firms, employing approximately 30,000 civil engineers in 1956, will require through 1958 an estimated 13,000 more—or about three times as many as were graduated in 1956 from all the engineering colleges combined. By 1960, it is reported that the contractors demand will total 20,000.

This estimated demand is somewhat inflated, to be sure, but it's a fact that contracting is becoming an increasingly scientific business. There are fewer contractors today who "carry their office in their hats," comments an AGC official. Today's contractor requires more engineers on his staff and more often than in the past he is a graduate engineer himself.

The contractors, and all others, in anticipating their needs, have the nations 10-year highway building program in mind. Its full effect on the manpower situation is yet to be felt.

In anticipation of it, the president of the Automotive Safety Foundation said recently that at least 1,200 traffic engineers are needed.

In anticipation of it, consulting firms—although they say they could use only a few new men right now—caution that an estimate made today may not be good days or weeks from now as the highway work really begins to break loose.

And in anticipation of it, state highway departments which employ about 20,000 engineers collectively, have a current demand for 4,000 to 5,000 highway and bridge engineers, according to Robley Winfrey, chief of personnel and training in the Bureau of Public Roads.

• **Needed at all levels**—Designers and draftsmen are among those most in demand. Drawing board jobs go begging. Says one personnel man: "Demand has resulted in too many chiefs, not enough Indians. A young engineer wants to go directly into design and refuses to do board work. It is extremely difficult to get good men willing to stay at a board."

Even designers working "off the board" are hard to come by—are much in demand. The top caliber man with experience is hard to get and to hold. Narrow differences between starting and top salaries have designers moving into administrative, sales and other positions. Improved working conditions and greater professional recognition are also incentives moving the top designer away from straight design work.

Yet, even in the upper management echelons, there is great demand. Top management in construction needs replacements. According to one estimate, 42% of the present executives of the civil engineering, construction field will retire within 10 years.

And in the educational field, the faculty replacement hunt is never-ending as teachers are lured to higher paying engineering jobs. "We are only eating our own seed corn," warns an engineering dean.

The demand is strong. Colleges are 10% understaffed, according to a recent report of Engineers Joint Council.

Generally, industrial organizations and contracting firms are meeting manpower demands as they occur, but public agencies have serious demands unmet. Work backlogs are growing in many offices.

The Corps of Engineers, biggest engineering organization in the federal establishment, is working with a depleted staff. Maj. Gen. E. C. Itschner, new Chief of Engineers says it can handle the present civil works program, but any greater program will require more professionals if progress is to be maintained.

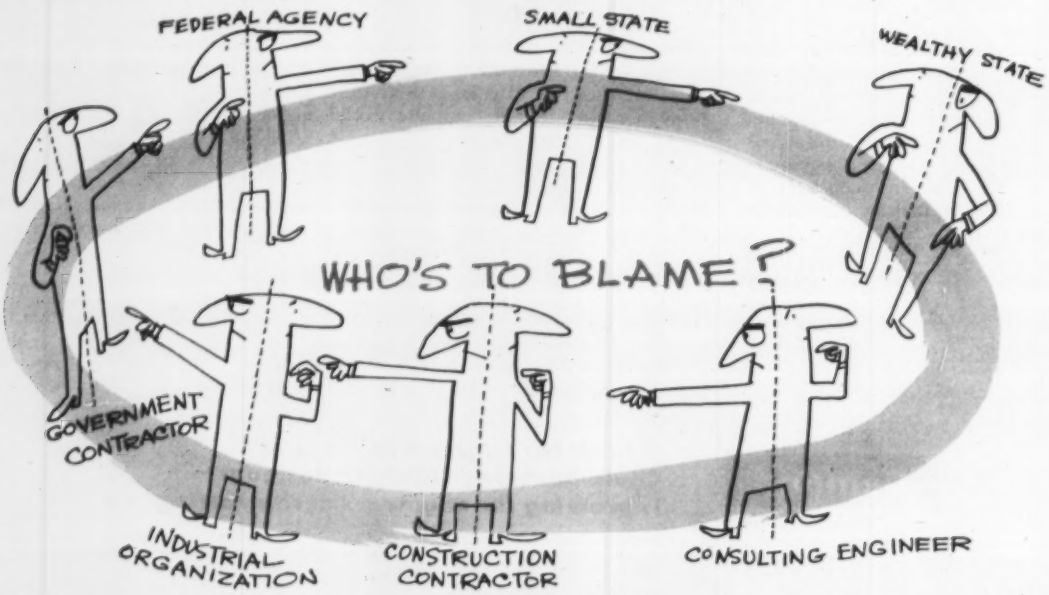
Demand will certainly increase. Highway activity alone will do it. And highway activity will breed other types of engineering and construction in need of manpower. Last year, one highway department spent $40,000 advertising for men.

Although definite figures for the construction industry are not to be had, demand is voiced everywhere—from "one good man" to "a hundred men." But, with the exception of some public agencies, the current need is not as great as one might guess.

The future, however, may bring a different situation.

(Continued on page 32)

Shortage ...Creates a vicious circle



Turnover Compounds the Situation Today

"Seems sort of a fluid situation", summed up one ENR correspondent after he had asked several engineer employers about their troubles with manpower. And fluid it is—but not critical. We have a manpower shortage, to be sure, but it is not yet a crisis.

This conclusion can be drawn partly from a look at the supply and the demand, but supply and demand findings don't tell the whole story, for they can't be subtracted, one from the other, for a definitive figure that is the measure of the manpower problem in construction. Supply is not something to be pinned down with exactness; and demand, as noted, is strictly an unmeasurable quantity.

Even if you can't subtract a supply figure from a demand figure and get an accurate shortage quantity, you can get an answer by comparing the supply and demand pictures. They're clear enough for that. And you can't come up with any answer but: "manpower shortage."

This is a conclusion confirmed by statements of the scores of people interviewed in collecting information for this special report.

"There are painful shortages of some types (but) there is a less severe shortage of civils. Design work has slowed down, but construction generally is not greatly influenced by the shortage of men," said one big employer.

"The greatest need for men is in the design field and the shortage outlook is: Permanent."

"Now that summer is over, our men here go on a 53-hour week, and we still have to put out a lot of design work to the so-called job shops."

"The papers are full of ads for experienced men, and some of these birds will jump for an extra five cents an hour."

Mobility? Yes—and instability.

"It seems", reported another ENR correspondent, "that money is the root of all evil."

Still another cited a case reported to him of highway engineers of a state road department who banded together to form a "company" and offered their services to consulting firms for work on evenings, Saturdays and Sundays. The man who told this tale speculated: "It would be a fine thing if a state road department found it was paying a consulting engineering firm to do bridge work and that the work was actually being done by its own employees after their regular working hours."

Far-fetched? Maybe, but there's no denying the prevalent trend that has highway departments with relatively low pay-scales having to hire consultants' forces at higher pay scales to get their work done. An official of the U.S. Bureau of Public Roads has stated that this practice triples the costs of highway departments.

It's a vicious circle in which employees appear to be moving. It's a circle in which you can almost envision employers standing, each one pointing an accusing finger at the next. The federal agency man is pointing perhaps at a state highway engineer who can pay a little bit more than he can. The state man points accusingly at the consultant who has taken his man. The consultant blames a contractor next to him around the ring. The contractor blames his personnel losses on a big industrial employer. And that industry's man has another big industry's employer to blame—perhaps one doing work for the federal government.

And so we come full circle. The movement of manpower stops just short of 360 degrees (the federal agency can't generally lure men back from industry). If it can be concluded that the federal government, suffering worst of all from

effects of the manpower juggling act in construction, is also at the root of it all (since federal money in construction is a principal cause of both the intense activity and the high salaries), the cause-effect relationship in this movement is complete. The evidence seems to bear this out.

Consider an example: Working our way back around the circle, a severe shortage is felt by a firm that has just gotten, or has hopes of getting, a big government contract. But the shortage doesn't last long with this company, for it is in a position to pay the price to get the help it needs. It hires men and thus passes along the manpower problem to the employers farther down the pay scale. All those employers affected, who are able to pay an attractive rate, recoup their losses at the expense of those who can't meet the pay check competition, ultimately the public agencies.

It's an employees' market to be sure, with a mobility that will be slowed down only as the opportunities available approach nearer equilibrium (a state they never reach).

ENR's June study of who got the civil engineering graduates in the class of '56 had in it some indications that we are not headed for complete and permanent imbalance due to this period of shortage. Some progressive public agencies have instituted competitive pay scales and are attracting a share of the graduates. On the other hand those who would buy off engineering talent for questionable, technician work—at high pay—are not as successful as one might suppose.

. . . And Pay Isn't the Only Cause

It is obvious that pay differentials are not the sole cause of all the movement in this period of demand in excess of supply.

Location is important. Florida employers get a good number of local boys who prefer not to venture into the cold world up North—plus some older talent gone South to keep warm yet willing to make it a working retirement.

Opportunity counts. Much of the current movement of construction manpower is toward the chances to advance, to assume responsibility. A good example is a very big, topflight New York consulting firm. It gets good young men easily, but admits it can't hold them beyond a certain point. As soon as they see themselves blocked in the big organization, out they go—frequently to a smaller consultant who will put them in a position of greater responsibility.

Fringe benefits are a real factor—increasingly so. Just as the public agencies, with all the security, vacation, sick-leave, pension and other fringe benefits, are going to have to come up into line with their pay scales; the relatively high-paying consultants and contractors must now think of insurance, hospitalization, in-service-training programs, plus other employee relations and working conditions that in the past have not been of much concern.

Specifically, the manpower shortage in construction is most serious in experienced designers, structural, hydraulic, electrical and mechanical. Of these, the need mentioned as most critical is for mechanical designers—these for utility and industrial plant design firms.

A second acute manpower situation is in the ranks of the engineering instructors and professors upon whom so big a responsibility rests for producing the future's manpower. The practice of hiring these people into industry is generally decried. Yet that is exactly what is too often being done.

A third area of shortage very often mentioned is that of draftsman. This seems to be a regional condition, largely traceable to inadequate supplies of technical high school and technical institute graduates—or a lacking awareness or appreciation of the worth of these sub-professionals.

If any further evidence is needed that demand exceeds supply, consider the plight of the Engineering Societies Personnel Service, Inc. Time was—recalls ESPS's Exec. Director A. H. Meyer—when this service got a big play from graduating classes. Not so today. In fact, ESPS has just changed its rules so that the employer now pays the entire fee. In effect, this one-time employment service is now in business—if not too busy—as a recruiting service.

A final look at the manpower shortage in construction shows it to be a compound thing. That is, the excess of jobs has brought on a movement of men which results in a loss in engineering output. More engineering could be done by the limited number of engineers and technicians available if they could be brought to settle down—stay at their jobs. Training men in new jobs is time consuming and often nonproductive. Losing trained men is downright expensive. Turnover is not conducive to efficiency; it's as simple as that.

(*Continued on page 34*)

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Despite the shortage, engineering talent too often is wasted.

Over the years, management has modernized its equipment, installed much of the latest mechanical apparatus, but too often has continued to employ the engineer at traditional, but outmoded functions. A re-evaluation of the duties of all members of the engineering team is badly needed.

• Management

Management consultants can help utilize personnel more effectively and economically.

Such firms work in a variety of fields and have analyzed all aspects of industry—marketing, production, sales and personnel—in companies large and small. They may be called upon to revise a production system, establish amicable employer-employee relations, or achieve a better utilization of men and equipment. The method of analysis depends upon the type of company and the nature of the problem.

For job evaluations, for example, these consultants will acquaint themselves first with the particular organization in order to determine relationships and functions of jobs; this is done by intensive internal study and association. Performance requirements and nature of jobs are then determined, and, if desired, individual personnel are appraised.

Actually, as one consultant points out, management is quite capable of performing these evaluations itself, but because of lack of time (or internal office politics) they seldom do so. Since management consultants are outsiders with "no axe to grind within a company," their advice is more likely to be heeded.

Thus far, management consultants have been employed mainly in other areas of industry and engineering. They are a definite possibility for construction.

• Organization

The team concept is fairly strong and well established in both design and construction, at least in organizations of considerable size. But whether the team members—engineers, technicians, and clerks—are all, and always, doing the right jobs is open to question.

Most common complaint from engineers in field and office is "too much paper work."

Time devoted to writing reports, filling out forms, hunting for texts and rummaging around in the stockroom for supplies should be eliminated. In a recent survey of 4,000 research and development engineers in 14 different industries (including construction) over 50% of employees reported that, in their opinion, they had some or many non-professional duties; these distractions from engineering work totaled in excess of 25% of their time.

Clerical help can relieve the professionals of such work. The State of Michigan, for instance, has assigned a field clerk to each project engineer to do detail work that was formerly the responsibility of a survey party rodman. It was discovered that rodmen frequently got behind in their work, and the engineer then had to take over some of this detail himself.

Fred S. Lohman, chief deputy city engineer of Los Angeles, reports that his office has discovered an amazing amount of time spent by professional engineers on non-professional jobs. After a thorough reshuffle, clerical personnel now performs much of the budgetary and statistical functions formerly done by the engineer.

Sub-professional aides, technicians, can handle a sizable portion of engineering work such as computing, estimating, surveying, drafting—any occupation requiring limited engineering know-how.

One organization found it could release 15 to 20 engineers by breaking down the totality of jobs and then bringing in sub-professionals. A monotonous job, which was filled by an engineer, had lots of turnover. The position was subsequently down-graded; a boy with a math background was found who could do the work and was happy with it. Turnover has stopped.

High school graduates are being trained to do many types of subprofession work. The Michigan State Highway Department has instituted an annual eight-week summer surveying camp for fifty high school graduates selected by a written exam. Upon completion of the course, students are hired by the department.

College students with a couple of years of engineering or a math background are another potential source of engineering team members.

One of the best sources of engineering aides, a source relatively unknown, is the technical institute, described on the next page of this report.

• Methods

If you would conserve available engineering manpower: Avoid duplication of effort, standardize procedures wherever possible. Standardization of plans, design drawings and specifications (with allowance for minor modifications) will enable draftsmen and others to handle more work in less time. Lack of uniformity, particularly in seemingly insignificant items, is a time consumer. In one company, where there were no regulations as to scale to be used for mapping information, some draftsmen used one type some another. This meant that someone constantly had to take two sets of figures and convert them to one. Definite scales and size of mapping have eliminated this time wasting procedure.

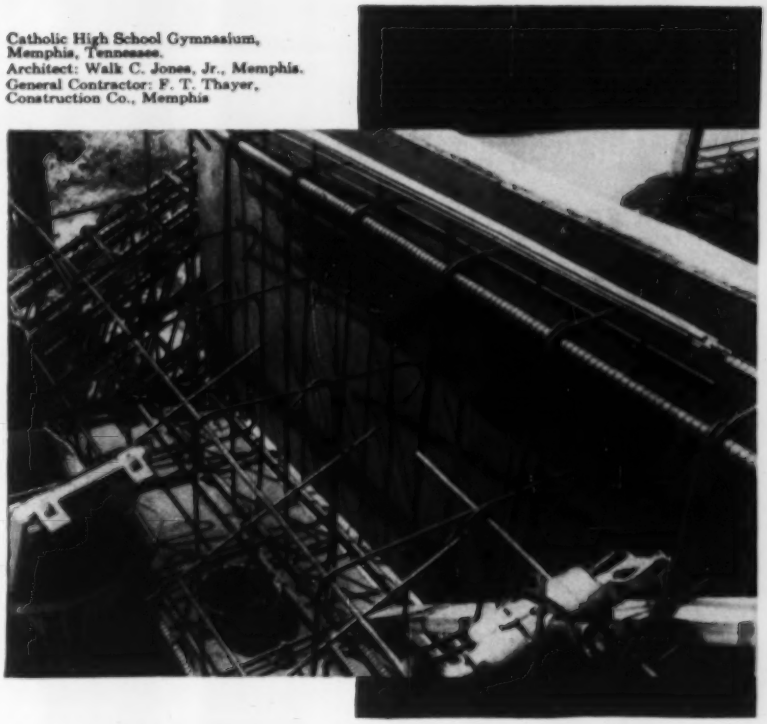
Keep your engineers up to date with latest developments, equipment and procedures. Monthly, or more frequent staff meetings can serve as a means to gather new ideas, iron out difficulties and eliminate wasteful practices.

Electronic computers are coming in for more and more attention. So far their use has been limited largely to highway construction (ENR July 12, p. 30), but a great deal of development is in progress in structural design fields, such as for bridges and tall buildings. Their effectiveness is particularly apparent when the machines are used in conjunction with fast survey methods. Coupled with photogrammetry, computers save considerable analysis and design time.

Reproduction of drawings by means other than manual can have excellent results. Typical is the photo-drafting technique employed by H. K. Ferguson Co. in Cleveland. This method involves addition or subtraction of details from photographic overlays and eliminates the necessity of re-drawing existing plant facilities. For an expansion of a large processing plant, where operations could not be stopped for construction, Ferguson had to install piping and equipment in precise sequence during sharply limited periods. A photo-drafting system, in which pictures of existing installations were accompanied by successive step-by-step overlays, saved the company much time and expense.

(Continued on page 36)

Catholic High School Gymnasium, Memphis, Tennessee.
Architect: Walk C. Jones, Jr., Memphis.
General Contractor: F. T. Thayer, Construction Co., Memphis



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. . . Proper Use of All the Manpower Available

• Technicians

One of the brightest hopes for a partial solution to the engineering shortage is an educational phenomenon that has boomed within the past decade—the two-year college, known as a technical institute or community college.

Though technical education is not new, it took World War II to bring into focus the need for trained technical manpower on a subprofessional level. Since that time there has been a growing realization on the part of industry, government and educators that a man, properly trained and oriented with a combination of limited engineering knowledge and manual skills can augment greatly the output of our existing engineering force.

In electrical and chemical industries, where demand for trained manpower is acute, use of technicians has become widespread. In the construction industry, their employment has been limited, but this picture is changing.

Today, there are over thirty architectural, construction and building programs being taught in U. S. technical institutes. Their unique post-high school curricula lie somewhere between vocational school training and professional engineering, and the product, the technician, stands midway between the skilled craftsman and the professional engineer. Generally he receives an associate degree which signifies completion of two years of work at college level.

The graduate has been trained in basic field, office and business procedures. He knows estimating, surveying, drafting, steel and reinforced concrete detailing and has a knowledge of the strength and use of building materials. And, to round out the man and provide a background for future responsibility, he has taken several English and social science courses.

• **Where do they fit**—As he enters your office for the first time, the graduate technician is equipped to serve as a member of a survey party, a draftsman, junior designer, estimator, expediter, engineering aid or inspector. And often the technician will advance to supervisory responsibility in the field and direct construction and erection operations.

At Truscon Steel Division of Republic Steel in Long Island City, N. Y., use of technicians was started about five years ago. The staff now consists of about 20% graduate engineers, 10% clerical help and 70% technicians (⅓ of whom are graduates of a two year community college). The latter do part of the work originally done by engineers.

Donald Rollins, vice-president for engineering of U. S. Steel's American Bridge Division stated last January that his concern employed 800 technicians and 700 engineers. "Specification writing, stress analysis, calculations and detail plan drawing are specific examples of work within the capability of good engineering technicians in this part of our industry," he said.

"Industry likes to use our people because they can be trained readily," comments Joseph Steinberg, head of the construction technology department of New York City Community College. "Training time (on the job) for our graduates is 50% less than the time required for a man without a technical institute background. Our courses are taught in an up-to-the-minute practical way and deal with fundamentals that can be applied in any situation."

Local, federal and state government agencies, who bear the brunt of today's manpower shortage, have begun to eye technicians hopefully, and are active in recruiting them. Many state agencies are setting up new series of sub and semi-professional positions. New York State, for one, plans to replace junior and senior engineering aide titles with four levels of semi-professional titles; a similar series for draftsmen is also planned. Massachusetts' Department of Public Works already has an engineering staff composed of 25-35% technical institute graduates.

Technicians are employed also within smaller municipal engineering groups. Cincinnati's Department of Urban Renewal consists of six men—two are graduate civil engineers, two are Ohio Mechanics Institute graduates, and two are institute students working on a co-op basis.

• **Recognition needed** — ENR researchers and correspondents found a large number of civil engineers and contractors who were unfamiliar with the role of technicians.

Some of the companies visited are still employing an all-engineering staff at great expense. Others, unable to hire professionals, had their existing force working overtime. Some were training their own help, and others expressed a willingness to hire technical help but did not know where to find

Will Increase Output, Cut Turnover

them.

There is an apparent reluctance by management to break down work into various sub-professional levels and thus make use of men with less than four years of formal school training. (In electrical and chemical firms this reluctance has disappeared of necessity.) In addition, some organizations refuse to recognize the seriousness of the manpower situation. In "normal times," argues one employer, when engineers are plentiful technicians will have little value.

According to William T. Cavanaugh, executive secretary of the Engineering Manpower Commission, "normal times" are a thing of the past. "There are too many signs which point out that this technological expansion is a permanent one," Cavanaugh exclaims. "The technician-engineering team is a more economical and efficient way to utilize manpower. The griping that occurs among engineers employed in sub-professional work can be eliminated to a large extent."

With the tightening manpower market, more and more companies are beginning to agree with Cavanaugh.

• And more technicians needed – Strangely enough, although the industry has only begun to recognize the technician, the demand for technical institute graduates already greatly exceeds supply. ENR's survey of institutes reveals that the average construction and civil technology student receives from two to five job offers upon graduation. And some employers recruit technicians at the schools—in the same way as they hire engineers on the college campuses.

At present, the enrollment of construction technicians is relatively small. Only 749 architectural, building construction and civil technology technicians were graduated across the nation last year. These were swallowed up almost immediately by firms familiar with the technicians' capabilities.

Actually, the shortage of technicians is closely akin to the shortage of engineers, although this may not be recognized generally.

But the supply of technicians can be increased relatively easily. Inadequate guidance in high schools, lack of knowledge about technical education by the general public, the failure of industry to make known its needs for this type of personnel, and in some instances the holding back of enrollment in institutes because of lack of teachers and facilities, all are responsible for the small number of students. Correction of any one or all of these factors will result in (and is already resulting in) more technicians. They take only two years to produce.

Enrollment is on the upswing. In some schools it is nearly double that of five years ago, and many institutes are expanding or are planning. Civil engineers and the construction industry can provide the necessary aid and recognition.

• And Finally, Turnover—and How to Stop It

The point was made earlier in this report that companies get less engineering out of their engineers because of instability—the turnover.

Turnover is a problem never to be licked entirely. But it can be reduced. It's a problem getting much thought these days, and ENR's study behind this report came up with answers from several sources. They add up to these reasons for turnover:

CAUSES:

• Inadequate pay-scales.

• Lack of permanency—Many civil engineering and construction firms still hire for peak work-loads. There is a constant hiring, firing and rehiring as the business cycle rises and dips for the given employer.

• Menial work, lack of responsibility, recognition or variety—Where engineers are forced to do a sizable amount of sub-professional work, turnover rate is apt to be high.

• Few opportunities for professional advancement.

• No fringe benefits—medical plans, hospitalization, vacations, retirement, etc.

• Personality clashes.

• Office politics.

CURES:

But the same people who are thinking about reasons for turnover have some ideas on how to avoid it:

• Place men in jobs that permit full utilization of abilities. Jobs that involve a great deal of routine and menial work should be down-graded or subdivided into professional and sub-professional duties.

• Attempt to channel an employee into the type of work for which he is best suited. "A wise employer finds the job that fits the employee—he doesn't use the reverse method," said one source.

• Develop a personnel-conscious attitude. Base promotions on medit, avoid office politics, give personal recognition for achievements, establish performance ratings.

• Provide incentives and opportunities for advancement. Few jobs are so interesting that a man is willing to work in them indefinitely.

• Endeavor to provide variety and experience. In one company, where turnover is low (though salaries are only average) a new man is moved around in a variety of jobs from field to office for one year. At the end of that period an attempt is made to place the man in the position of his choosing. (This is also good training for future managerial positions.)

• Train your management from within. Nothing causes such dissension within a company as when an outsider is brought in to occupy a top job.

• Offer stability of employment and fair salaries. Establish as many fringe benefits as feasible.

• Develop in-service-training programs. This produces a better quality of work and provides a basis for upgrading of employees. Morale is increased when management shows an interest in advancement of employees.

• Encourage employees to continue and complete education. Many a technician is capable of becoming a valuable professional with a little push. Many an engineer can be made the office expert in an important field through some employer-sponsored post-graduate work.

• Promote and facilitate interest and activity of employees in professional and trade organizations.

(Continued on page 38)

Guidance ...For The Future

Photo courtesy Bechtel Corp.

"Me be an engineer?"

For the Future: Get More Engineers

If the added engineering manpower supply for five and ten years hence is to be principally engineering school graduates, the source of that future supply is now in the high schools and junior high schools. What is being done to guide a reasonable number into engineering—into civil engineering?

There is no question but that the high school guidance people have heard of the engineering shortage, and that they are willing, able and equipped to tell their students of opportunities in the field, but the whole guidance job doesn't rest with them. ENR had barely begun work on this report when the accompanying statement by a high school guidance counselor came in as an "over the transom", unsolicited contribution. It sums up a part of the manpower picture, and it states forcefully that the high schools can't change the picture without help.

High schools have this necessary help in many parts of the country, where professional groups—notably the Engineers Council for Professional Development and the National Society of Professional Engineers—have long had programs of student guidance.

ECPD's effort in the New York metropolitan area is examplary. All five founder societies participate by maintaining and supporting (financing is modest) student guidance committees which are, in effect, speakers bureaus.

In a school year, some 50 high schools may request programs. These are visited by a five-man speaking team with a thoroughly thought-out program to present. The chairman in the group talks 20 minutes or so on engineering as a career, usually stressing the engineer-technician relationship before concentrating fully on the professional level. Each of the five men then talks for five minutes on his particular branch (civil, electrical, mechanical, chemical and mining and metallurgy). Then the program opens up for questions.

This is definitely not a selling attempt—at least not a hard sell. The group stresses that its function is merely to inform the audience, not recruit it, and there is no obvious stress purposely given any branch of engineering. The feeling in this guidance work sincerely seems to be that it is as important to keep from engineering those students without aptitude as it is to attract a portion of the mentally qualified.

There are no overall indications of the success or failure of this program. But individual instances exist wherein college students claim to have decided on engineering as a result of one of these guidance programs.

• **Field fairly fertile**—There is evidence of the effectiveness of this program in written comments of students following a typical meeting:

"This conference gave me a general idea of the important role engineering plays."

"I found out about the different kinds of engineering."

"There are women in engineering."

"I did not know of the great variety of occupations."

"Discussing engineering with people who are actually working at it was of great value."

"In this profession you work in teams."

"If we were made to attend conferences like this in our early terms, there would be many more candidates for engineering."

All pretty cogent comments, coming from kids. The final observation is especially telling: too often the audience is past the secondary school's point of no return on engineering school entrance requirements. Guid-

ance Counsellor Ohles' article (right) also comments on that important factor rather tellingly.

Getting engineering across to prospects for the profession therefore means telling the profession's story to real youngsters, or, more importantly perhaps, telling it to their parents—the general public.

Just how good or bad a public relations job civil engineers are doing for themselves was not an intensive part of this study. But one ENR correspondent pinned the subject down pretty well in his report from Detroit.

"One of the great needs, according to the people I talked to, is an adequate public relations program for the profession—a program to acquaint the public fully with civil engineering. I checked out one guy who said 7 out of 10 people do not know what a civil engineer is or does by doing my own street corner survey—and doggoned if he wasn't right. I asked 30 people and only 4 told me anything that could be classified as near right."

When nearly 9 out of 10 people on a street-corner in Detroit don't know what a civil engineer is, something is wrong.

• Public relations are a serious need—The American Society of Civil Engineers has a new booklet in the works, and all across the country there are firms and agencies doing their parts to spread the facts about civil engineering as a career. Facilities for sidewalk superintending, plant and job tours and national advertising help.

A few years ago, The Advertising Council, Inc., did a voluntary job for the Engineering Manpower Commission of Engineers Joint Council. One of its member agencies produced a slick 22-page booklet titled "How Your Company Can Promote Engineering As a Career." It explained the engineering manpower problem, told the engineering-careers story, and gave a check-list of things to be done in guiding and recruiting engineers. Finally, it set forth in specifics how advertising could be put to work to tell parents, teachers and the general public the "Engineers Wanted" story. Sample radio, television and newspaper approaches to the public were presented.

Still all sources admit that there is serious lack of information on engineering getting to the public—little to guide them to a fuller appreciation.

Dean Thorndike Saville, current president of ECPD, declares civil engineers woefully lacking in dramatization of their work.

Youngsters are interested in electronics, nuclear engineering and aeronautical engineering. Those are the fields with the appeal today.

By comparison, the field of construction lies fallow. In this case the crop is lean.

(*Continued on page 40*)

A high school guidance man says:

Don't Blame Us

John F. Ohles
Crookston Public Schools
Crookston, Minn.

High school teachers, administrators, and counselors are the objects of a vigorous writing, whispering, demanding, cajoling campaign whose theme song is "Give Us More Engineers". Being low man on engineering's educational totem pole, the high school is in the unenviable position of receiving all the blame for the engineer shortage.

Let us critically examine the prospective engineer from the ninth grade on up to see where recruiting bottlenecks may be.

First bottleneck demanding consideration is the simple fact that many able ninth grade students are not going to be interested in engineering. Unless or until we are ready to destroy free vocational choice, our high school students will make their own decisions.

This does not mean that information concerning engineering as a vocation is not made available to our students, along with that of many other occupations. The various fields of engineering are probably better supplied with pamphlets and posters than any other area, with the possible exception of nursing. It is not that the story of the engineer fails to reach our students; this bill of goods is not so easily sold.

The science-mathematics pre-engineering high school course is "not for me" to many young people.

Many potential engineers do not settle on an occupational choice before graduation from high school—or for that matter until well in their college program. But a decision delayed one year in high school may be complicating, and two or three years along may be fatal. The demands for acceptance to a college engineering program are often so exacting that the early bird is the only one who has a chance at the worm. For many, then, engineering is out because they fail to mature in their ideas and interests as early as an engineer apparently should.

The high school cannot avoid its share of the responsibility, for many small schools do not (and cannot) offer much in science or mathematics.

However, probably the greatest bottleneck in engineer recruitment is the engineering college, itself. Riding the crest of an ego inflated by the scientific age, the college has become a tough taskmaster. None enters these hallowed halls before each and every exacting prerequisite is met. It has become such a horrendous task to fashion silk engineers out of sow ears that the sequence often has been lengthened to five years jam-packed with courses, each more essential than the next. Nowhere in this program is there anything so superflous, so repetitious, that a small school graduate could "sneak in" a prerequisite math course.

A convenient back door should be provided for those who choose engineering late in a career.

No discussion of the supply of engineers is complete without a thought about the engineer out of college. It is no secret that many business firms seek out graduate engineers for sales and administrative positions. Meritorious as these utilizations of an engineering degree may be, one cannot avoid the assumption that it also serves to deplete the ranks of practicing engineers.

There must be various avenues open in the search for more engineers. Certainly, these imaginative souls who daily compound technical miracles can do better than point an accusing finger at only one link in the chain, the neighborhood school house!

Money . . . For Education

Most private institutions of higher learning today are in trouble financially. Everybody knows it. And everybody agrees something must be done about it. And all are in accord in their acclaim for the magnanimous giving of the Ford Foundation and the many other corporate givers of money to education—most of them manufacturing industries.

But what of the construction industry? What is *construction* doing to aid education? Bigger than manufacturing, largest of all industries, producer of 11% of the gross national product—what is this bulwark of the economy doing to help the colleges and universities to enlarge their facilities for the increased enrollments to come?

This survey's finding: Not much.

The oft-heard reason: Construction is not made of GM's and GE's, it's just a great many relatively small operators. What could any one of them do that could amount to much against education's big need for financial support?

The need is known and there exists a Council for Financial Aid to Education, which is endeavoring to make the need appreciated by industries. ENGINEERING NEWS-RECORD asked representatives of this non-profit organization whether they knew any firms in the civil engineering and construction field that are aiding education. Offhand, they could name none. This is indicative, even though it does not mean that engineering and construction firms are doing absolutely nothing.

Evidences of aid to education by the construction industry are to be found all across the country, however sparse they may be.

The best organized effort to see that construction does its part is perhaps the work of the Associated General Contractors of America. This is mostly a grass roots effort of local chapters, taking the form of moderate-to-sizable scholarships or other forms of aid.

Outstanding examples of individual companies contributing to support of educational institutions also are to be found. The big-time engineer-construction firm that contributes $30,000 to $50,000 per year to engineering schools on the West Coast—no strings attached—is a prime example.

There are many ways of giving such financial aid. Most desirable, so far as the recipient is concerned, is the unrestricted gift; the school can use the funds where they are needed most. This does not mean, however, that schools in need will begrudge any contribution specified for some pet purpose of its donor.

Not all the giving to colleges today is completely altruistic. One big manufacturing firm establishes a scholarship in a school for every given number of graduates it can hire—sort of a bounty. Another firm, in the construction field, had a giving program working for a time which was nothing but a recruiting gimmick—it was discontinued when manpower needs were met.

Neither is all the giving to education from our field a matter of public knowledge. It's a subject—ENR found in this survey—that people don't like to talk about. Part of this reticence is based on the modesty of the generous.

Unfortunately, the many partnerships doing business in construction—consulting engineer in particular—cannot be "corporate" givers. Whatever portion of the profits of such businesses is being sowed into education is an unknown quantity, the private affair of each individual partner. Tax laws being what they are, financial help to schools is not fully as attractive a venture to individuals as it is to corporations. But this doesn't mean individuals aren't or can't be givers.

Colleges, generally, report that they are operating to the limits of their physical plant and beyond the limit of the all-important and critical factor—their faculties. If they are to handle the increased enrollments ahead, money is needed for both buildings and staff.

The colleges' need is general, across-the-board. But by satisfying the overall need, the need for greater future numbers of civil engineering graduates will have been met.

Recruiting . . . For Tomorrow

The trend in recruiting is very definitely to get in early. And there is evidence that even now, recruiters are often not early enough.

Recruiting, says one personnel man, must extend right down into the college—to juniors and sophomores, maybe even freshman.

His point is this: He needs electrical engineers for power plant design. It does him no good to talk to seniors who two years earlier chose to take an electronics option rather than power courses.

Within civil engineering, the same could be said of the structural, sanitary or other options offered by the engineering schools.

It's a matter of directing or enticing the graduates, fresh out of school into the jobs most in need of them. ENR's survey last June on who got the class of '56 (referred to earlier in this report) indicated that most employers within construction who really need men were in there pitching to get them. And the graduates, it was reported, kept a level head—chose positions not on pay alone, but on location, type of work, working conditions and opportunity for advancement.

The point has been made repeatedly in this report that civil engineering graduates are but one source, albeit the basic source of manpower for construction.

Recruiters will do well to look beyond the colleges toward recruiting the technical institute graduates. As pointed out, the present supply of these is limited, but a point to remember is that technicians with two years terminal education beyond high school can be produced twice as fast as graduate engineers. They should be the recruiter's real concern in today's tight situation.

Recruiters also could have a field day among the bright high school graduates—both boys and girls—who lack funds or motivation for college, if, and it's a big if, the employers in construction more fully take from their engineers the tasks that any bright high school graduate can do.

According to one source in a state highway department that can remain unidentified: "They can take a bright kid and in a few weeks have him designing highways." Granting some exaggeration in the claim, this state highway department, or any other, would admit to its need for high school graduates in a myriad of sub-professional engineering tasks. Certainly from the more than a million high school graduates-a-year the recruiters are going to have to attract a large volume of non-professional brainpower if the professionals who engineer construction are going to meet the challenge of the years ahead. **END**

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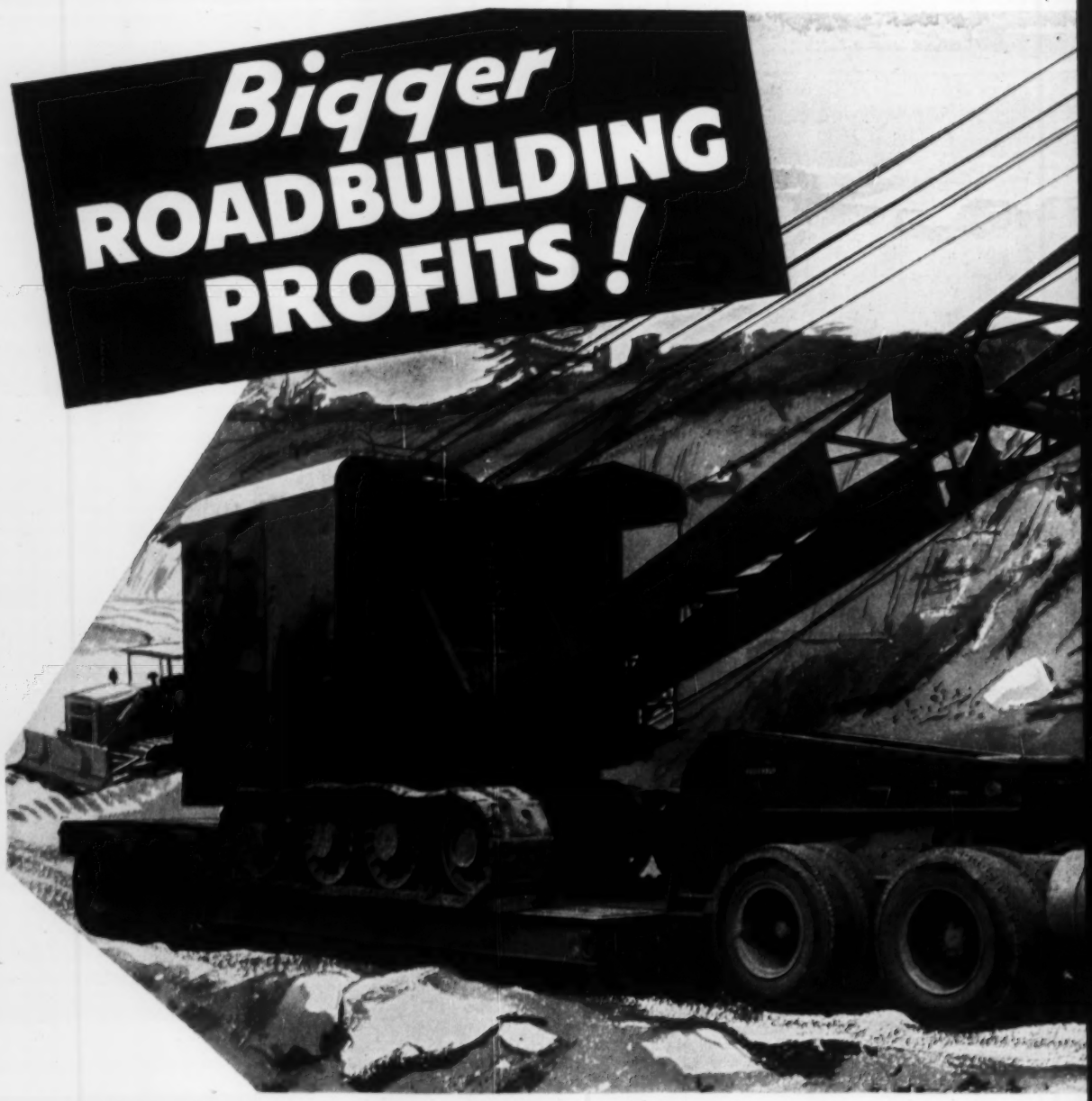

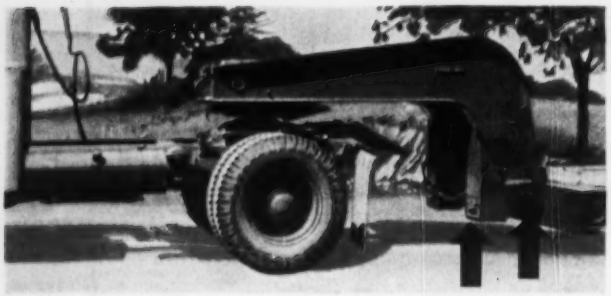

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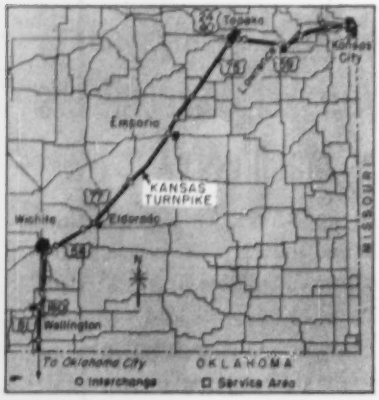
Kansas Turnpike: 236 Miles of Deluxe



Extending 55 miles west from Kansas City to Topeka, then angling southwest to Wichita and south to the Oklahoma border, the 236-mi four-lane divided turnpike will save 37 miles of driving and at least an hour driving time. There are 6 service areas and only 14 interchanges.

Twin roadway pavements separated for safety . . . easy grades and gentle curves to relieve motoring monotony . . . reflectorized for night-time delineation . . . controlled access . . . free-flowing interchanges engineered for high-speed traffic . . . and service when you need it.

That's what the Kansas Turnpike motorist found when the 236-mi, $160-million toll project was officially opened to traffic on Oct. 25.

For passenger cars the average toll is 1.7¢ per mi. For trucks, about twice that much. But for both, it means deluxe motoring at its best, as the four-

TWO INTERCHANGES, serving the Lawrence area are only 1.5 miles apart. The east one (background) connects with the downtown area, while the "Jayhawk" interchange leads to Kansas University as a service to football crowds.

Motoring

lane divided turnpike winds its way through the hilly terrain west of Kansas City, crosses the Kansas River at Lawrence and passes through the flint hills and cattle country around Emporia, the oil fields near Eldorado, the aviation industries at Wichita and south to the Oklahoma border.

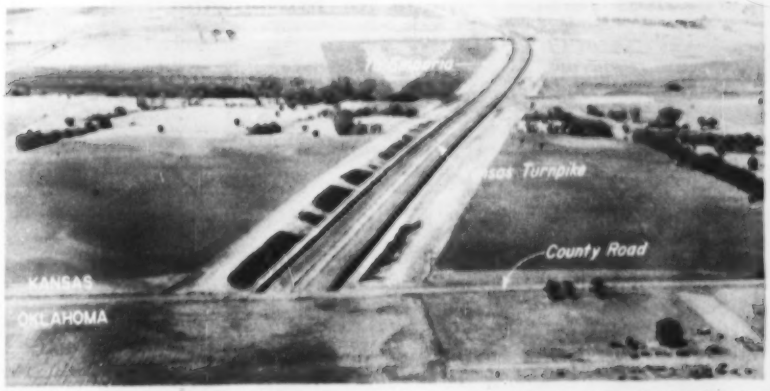
• **Terminal connections**—At present the Kansas Turnpike dead-ends at a county road marking the Oklahoma-Kansas State line. But this bottleneck will soon be eliminated. The Oklahoma State Highway Department will build a short length of four-lane divided highway connecting the Kansas Turnpike with U. S. Highway 177. Eventually it will be extended on to Oklahoma City as part of the interstate system.

Terminal connections at the eastern end of the Kansas Turnpike, at 18th St. in the southwest part of Kansas City, Kan., are more advanced and more complicated. A cloverleaf interchange marks the end of the turnpike. It's about one mile inside the city limits, and that stretch of turnpike is free from toll charges.

Connecting with the 18th St. turnpike interchange and extending easterly and northerly to 5th St. is a 1.8-mi, $3.5-million stretch of Muncie Boulevard Expressway being constructed by the Kansas State Highway Commission. It matches the turnpike in design standards plus the fact that its 34-ft median will permit adding two inside lanes to make it a 6-lane divided expressway. It is a free expressway, now 25% finished and scheduled to be completed next summer. Next year the State Highway Commission expects to extend this route as a 6-lane expressway about one mile to the Intercity Viaduct interchange on the west bank of the Kansas River. Estimated cost including interchange is $4.7 million.

• **Turnpike features**—As the 236-mi Kansas Turnpike is added to the network of tollroads now in operation in this country, its outstanding design, construction and operating features are worthy of note and record. Some are similar to contemporary features of other turnpikes. Others are innovations developed by the general consultants, Howard, Needles, Tammen and Bergendoff, under the direction of Josef Sorkin, managing partner, together with the turnpike's general manager, Gale Moss.

Also contributing to the high standards of design and construction were the 14 firms of consultants, or section engineers, and the three architectural firms who prepared designs and supervised construction.



TERMINALS FORM A CONTRAST Southern terminal temporarily dead-ends at a local road on the Oklahoma border . . .

. . . but the eastern terminal is the 18th St. interchange in Kansas City, Kan., connecting with an $8-million expressway being built by the state highway commission to the Intercity Viaduct which joins the two Kansas Citys.

• **Roadway design**—Both rigid and flexible types of pavement were used in the twin 24-ft roadways separated by a 20-ft depressed median. Each type was selected from the standpoint of economy of construction based chiefly on location of available materials.

The 55-mi stretch of turnpike pavement from the eastern terminal at 18th St. in Kansas City to Topeka is reinforced portland cement concrete. The 181 miles of pavement from Topeka to the Oklahoma border are asphaltic concrete (ENR Feb. 23, p. 36).

Both types of pavements have 10-ft bituminous shoulders along the outside, and 4-ft bituminous shoulders along the inside. The 10-in.-thick reinforced concrete pavement is carried on either a 5-in. subbase of crushed stone, or 4 in. of crushed stone subbase and a 1-in. leveling course of sand. The 4-in.-thick asphaltic concrete pavements have a 1½-in. surface course, a 2½-in. binder course on an 8-in. crushed stone base course, supported by 10 in. of subbase material.

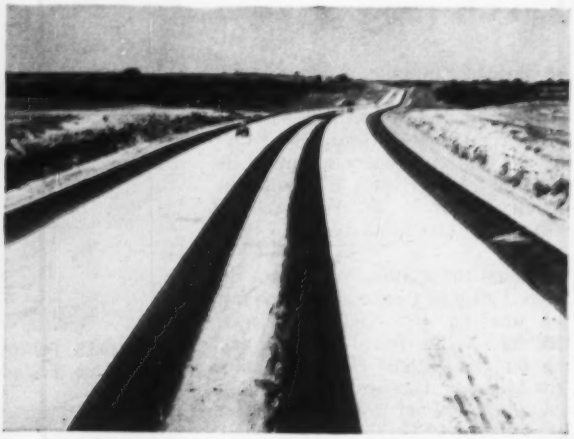
• **Guardrail**—Even at relatively high speeds the motorist will enjoy comparative safety from flattened embankment slopes where feasible, and generous usage of guardrail. In general, embankment slopes are 1 on 4 for fills under 10 ft in height.

Guardrails are installed along the outer shoulders of all roadway embankments over 15 ft in height. Two types of guardrail are used. South of Topeka where the snowfall is lighter and prevailing winds are less apt to cause drifting, a flexible beam-type guardrail is used. But east of Topeka, in the snow-belt area, a wire-rope-cable guardrail was chosen to facilitate snow removal by plowing and to lessen tendency of snow drift formation.

• **Limited access**—The turnpike features limited access from end to end. There

. . . Kansas Turnpike—Made for fast-flowing traffic

Contrast in black-and-white— Black-top pavements of asphaltic concrete are flanked with lighter bituminous shoulders . . .



. . . while portland cement concrete pavements have jet-black bituminous shoulders. Both methods are for better delineation.

are no railroad or highway crossings at grade, nor any stop lights. And there are only 15 points of entry or exit in the entire 236 miles.

All but one of these are free-flowing interchanges of single-trumpet or clover-leaf design. In addition there are long decelerating and accelerating lanes leading to and from the six service areas.

The six service areas, located about 40 miles apart will furnish food and soft drinks, motor fuel and service, but no sleeping facilities. They are located between the opposing turnpike pavements which are spread 780 ft apart c-c of pavement at the three major service areas and 580 ft apart at the others. Generally, the service areas measure about one mile in length.

Service Areas, located between turnpike pavements spread about 1,000 ft apart have long accelerating and decelerating lanes for maximum safety. Both economy of construction and operation result from these single service areas instead of duplicate facilities found on other tollroads.

• **Fast-flowing traffic**—In keeping with the general concept of turnpike operation, the 236 miles of four-lane divided tollroad were designed and engineered to handle large volumes of traffic at high speeds and with comparative safety.

A motorist traveling the entire length of the turnpike for a toll charge of $3.80 will save 37 miles over state highway routes. Moreover, he will save considerable time. For the posted minimum speed is 40 mph while the maximum is so-called "reasonable and proper". However, speeds in excess of 80 mph will be considered "neither reasonable nor proper" by the 14 patrolmen covering the turnpike.

• **Night-time driving**—Generous usage of reflectorized delinerators add to the comfort and safety of the night-time motorist. Three continuous lines of reflectors on light-gage steel posts mark the outlines of both roadways.

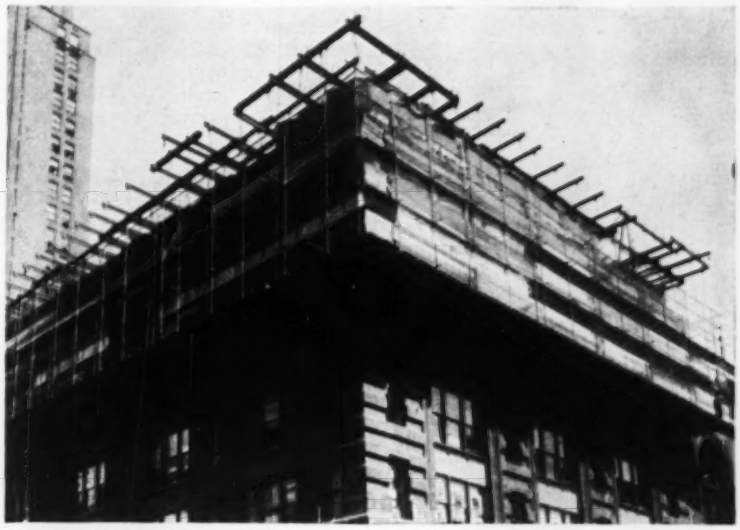
Reflectors in the two lines along the outer shoulders are spaced 300 ft apart and are mounted 3.5 ft above the roadway pavement. The line of reflectors along the center line of the median are mounted 1 ft lower to avoid giving the motorist a feeling of being hemmed in. They are 600 ft apart on tangents and 300 ft on curves.

Mercury vapor lighting is used at interchanges, service areas and along entrance and exit lanes.

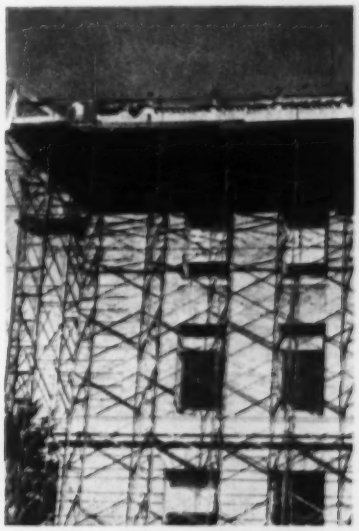
• **Jayhawk interchange** – The turnpike designers believed in providing traffic

(Advertisement)

Scaffolding Methods . . . for Cornice Removal

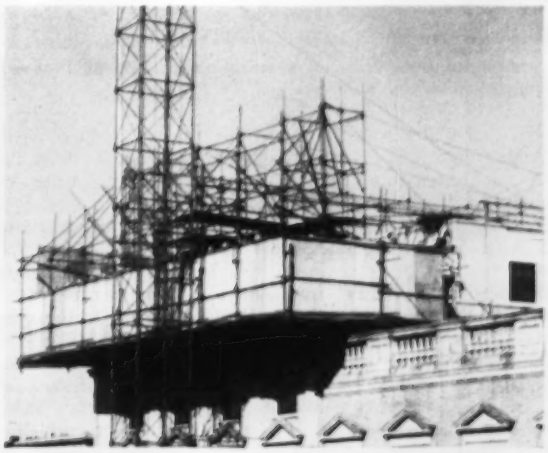


ROOF SUSPENSION—3-level hanging "TubeLox"® Scaffold, with protective "Gold Medal" Sidewalk Bridge, helps in removal of the wide overhanging cornice and terra cotta ornamentation extending a full story and a half down from the top of the First National Bank Building in Chicago. Peter Masterson Co., contractor, exposed the top flange of the roof beams and PS Co. anchored 7" double outrigger steel I-beams to them with double beam clamps. 8,500 lineal feet of "TubeLox" Scaffolding, with canopy, suspends from the outrigger beams to provide three working levels.



FROM THE GROUND—This 350-frame "Trouble Saver"® Sectional Scaffold, built up from the ground for cornice removal on Simmons College, Boston, is used on this low building because it was the most economical and practical method. Hew Const. Co., contractor. U.L. approved.

HANGING TO THE JOB—"Gold Medal" Suspended Scaffold Machines are hung from double 7" I-beams attached at roof level for this decoration removal job on the America Fore Building, Chicago. Clarence Cross Co., contractor, finds this method to be safe and efficient in moving workmen from level to level quickly. U.L. approved.



CANTILEVER—To remove cornice from the tall Clift Hotel, San Francisco, a unique scaffold made of 11,000 lineal feet of "TubeLox" Scaffolding is cantilevered over the parapet. The scaffold is tied back each bent by roof hooks, cables and turnbuckles. Phoenix Simpton Co., contractor, also tied a 240' "Gold Medal"® Heavy Duty Hoist Tower into the scaffold and building.

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. . . Turnpike Operation and maintenance

Three bituminous pavers make short work of laying the 24-ft-wide asphaltic concrete roadway pavement south of Wichita . . .

. . . while twin pavers team up to speed construction of 24-ft-wide reinforced concrete roadway pavements near Kansas City.

facilities that will generate a maximum of revenue and furnish a high degree of service. Unique examples include an interchange largely to serve football motorists and two interchanges complete with miniature stockyards for cattle.

The so-called "Jayhawk" interchange located on the west side of the Kaw (Kansas) River at Lawrence is for the the convenience of westbound travel from that city, and gives direct access to the stadium at Kansas University. A second interchange located 1½ mile to the east, on the other side of the Kaw, serves the business area of Lawrence.

• **Cattle interchange**—There are three separate facilities for handling cattle. One is located near the town of Cassody (20 miles north of Eldorado) adjacent to an overpass that carries a state road over the turnpike. It has cattle-loading pens and special interchange facilities for trucking cattle onto and off the turnpike—either on their way to fattening in the surrounding pastures of Bluestem grass or on to market.

A second cattle-loading facility and a special turnpike overpass, located 20 miles farther north is accessible by truck only from the turnpike. In addition to the two miniature stockyards, there is a special turnpike cattle overpass along a cattle trail midway between the two holding-pen areas. This is solely for the purpose of driving or trucking cattle from one side of the turnpike to the other into new pasture areas.

These cattle overpasses are conventional reinforced concrete bridges except that they have waist-high parapets instead of curb-and-handrail. Also the roadway carries about 12 in. of earth fill, since the cattle don't take to bare concrete.

• **How it will operate**—To build this 236-mi turnpike with its 254 bridges, 14 interchanges and 6 service areas in the relative short span of two construction seasons was a construction accomplishments of high order.

And to operate the $160 million facility, maintain it the year around through good weather and bad, patrol it for safety, and provide the high type services for food, comfort and motoring supplies that the turnpike patron expects, presents a multitude of other challenges and requires a smooth-working organization.

Gale Moss, general manager of the turnpike, is building up just such an organization. About 30 personnel will be employed in the headquarters at the East Wichita interchange. There will be a chief engineer at the Wichita Division headquarters, and an assistant chief engineer at the Topeka District headquarters.

• **Eight maintenance districts** – For maintenance operations the 236-mi route is divided into 8 districts, each about 30 miles in length. There are two maintenance engineers; each in charge of four districts and reporting to the chief engineer and assistant chief engineer, respectively.

There is a total of 8 maintenance shops—at Wellington, Wichita, Eldorado, Cassody, Emporia, Admire, Topeka and Bonner Springs. Each shop is in charge of a foreman, under whom are three experienced maintenance men. These four form the nucleus of each district maintenance force. Additional personnel, such as truck drivers, equipment operators and laborers, will be hired locally on an hourly basis.

• **Equipment pools**—As would be expected, an impressive amount of maintenance equipment will be needed. Hundreds of acres of right-of-way will need mowing in summer, and a snow and ice removal can reach gigantic proportions in winter. Most of the mobile maintenance equipment was purchased and on hand in two maintenance pools at Topeka and Wichita prior to the turnpike opening.

Total cost of the maintenance equipment is in the neighborhood of $600,000. It includes such major items as 40 trucks of which 20 are heavy duty; 32 truck-mounted snow plows; 32 pull-graders; 48 tractor mowers; 18 tractor loaders; 10 motor graders; 8 road sweepers; 4 rollers; 2 heavy-duty crawler tractors with bulldozer blade; two 6-yd hauling scrapers and two ½-yd crawler cranes.

The list of mobile maintenance equipment also includes 32 material spreaders, 8 asphalt kettles and 2 distributors for bituminous work. Also two each of the following: 160-cfs air compressors, 6-S concrete mixers, weed sprayers, striping machines, paving breakers, rock drills, concrete saws and backfill tampers, in addition there are four 3-in. self-priming pumps.

Over 250 major items of equipment were divided equally between the district maintenance shops at Topeka and Wichita ranging from 60-ton hydraulic presses to 3-ton chain hoists, or sickle grinders. The turnpike commission also has stocked 5,300 gal of white paint, 2,150 gal of black and 200 gal of yellow, for its striping operations.

"Down Easters" extend the nation's first major Asphalt-paved Turnpike

Last December Maine opened this sweeping new expressway.

It extends the original 45-mile Maine Turnpike 66 miles . . . Portland to Augusta.

The nation's first major Asphalt-paved Turnpike, it has an enviable record for safety—for earning revenue. Asphalt construction saved over $1,000,000 in first costs — maintenance costs have been low—income is years ahead of debt retirement needs. What better endorsement for Asphalt construction for the new Extension?

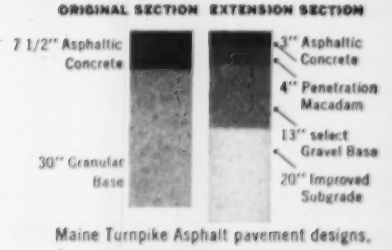
Engineers lay groundwork for even better record on Extension

Maine's engineers, looking for even better performance, made three moves in designing the Portland-Augusta Extension.

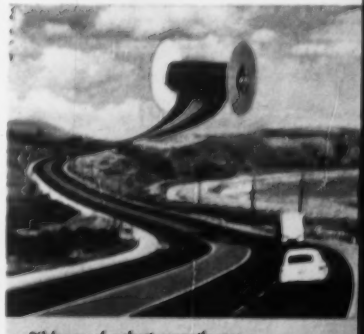
1. ***They depressed the median strip.*** This measure reduces material needs, improves drainage, simplifies snow removal.
2. ***They reduced wearing course thickness*** and at the same time "beefed" up base structure by penetrating it with Asphalt. This move both cuts cost and aids flexibility and strength. (See chart for details.)
3. ***They paved inner and outer shoulders.*** As the WASHO TEST shows, this adds greatly to pavement life and cuts maintenance costs. It also improves safety.

Low construction cost has already justified these measures. Maintenance costs and safety figures are expected to follow suit.

For low road costs and high road performance follow Maine's lead. Adapt modern Asphalt construction to *your* roads.



Maine Turnpike Asphalt pavement designs.



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"We used Gold Bond Insulation Roof Board because it always gives us what we want. It resists compression, it's easy to mop, and it doesn't soak up asphalt." Al Lauer, District Manager of Warren-Ehret Co., roofing contractors on the new cafeteria at the Mesta Machine Co., Pittsburgh, gives these three reasons for choosing Gold Bond for the job.

Here's what's behind Mr. Lauer's reasons: Gold Bond Insulation Roof Board stands up under heavy installation traffic—loaded wheelbarrows, workmen's feet, sharp-edged asphalt buckets. The insulation value isn't *squeezed* out of the roof board!

The smooth surface of Gold Bond Insulation Roof Board permits faster, easier mopping and maximum coverage of asphalt or pitch. You cut labor costs and get a better job, besides. Gold Bond Insulation Roof Board has a minimun absorption of pitch or asphalt —you save on material and maintain high insulation value as well.

Gold Bond Roof Board is moisture-resistant—each fiber impregnated with water-resistant asphalt or resin. Both types are also available with full asphalt coating for still further moisture-protection. You can order square, shiplap or offset edges.

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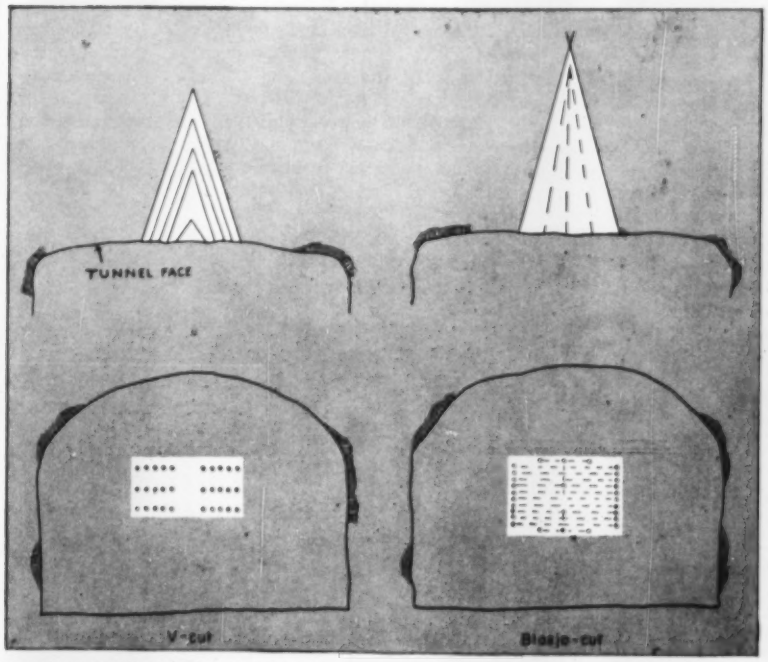


HOLE ARRANGEMENT for "cut" in tunnel blasting. The new Blasjo-cut gave a greater advance per round than the conventional V-cut.

MODEL OF BLASJO cut shows how holes are arranged.

New Drilling Pattern Used On Swedish Hydro Tunnel

Inability to attain more than a 13-ft advance per 7.5-hr shift using the conventional V-cut method of drilling and blasting caused Swedish tunnel drivers to develop a new drilling pattern for the cut-holes, which upped the advance per shift—drilling, blasting, mucking—to 18 ft. Since the tunnel has a section of 580 sq ft, this represents a mucking rate of about 390 cu yd per shift.

DRILLS WERE MOUNTED on a guide rail, with the steel supported at the outer end, to assure as accurate alignment as possible.

The tunnel is part of a hydro project being developed by Blasjon Kraft AB in western Sweden. It is 4.3 miles long and connects two lakes having a 300-ft difference in elevation. The rock encountered is of mountain schist type, gneissic at one end and schistose at the other.

The arrangement of the holes in the Blasjo cut is shown in the accompanying drawing, comparing it with the V-cut, which it replaced. The length of the cut-holes is 21.5 ft, their inclination 3:1. They were drilled with tungsten-carbide-tipped integral drill steels in the following lengths and diameters: 5 ft 3 in. x 33 mm; 13 ft 1 in. x 30 mm; 21 ft x 28 mm; and 23 ft 8 in. x 27 mm. The charge per hole was 5½ lb of 1-in. dynamite, the blasting caps were electric short delay 0 types, and the spacing of the holes was 6 in.

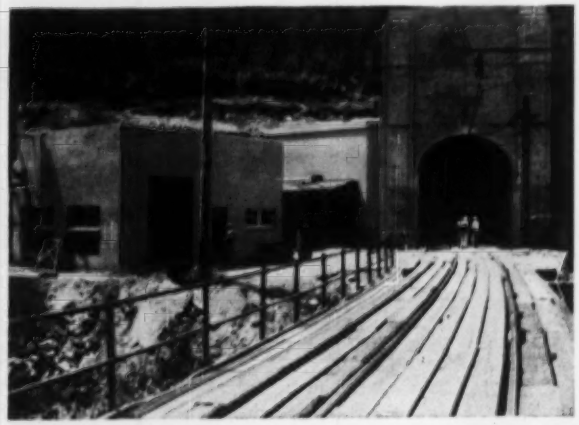
Drilling was carried out from a platform mounted on a truck, using two light rock drills with pneumatic pushers. To control the direction of the holes as accurately as possible, the drills were mounted to slide along a guide rail fabricated from steel angles. The rail was supported at the desired levels on a vertical pipe fastened to the platform. Also at the end of the rail nearest the tunnel face there was a support for the drill steel to hold it steady and in alignment. One man generally operated the two drills, except in the very schistose rock where the risk of stuck drill steels

. . . Drilling pattern

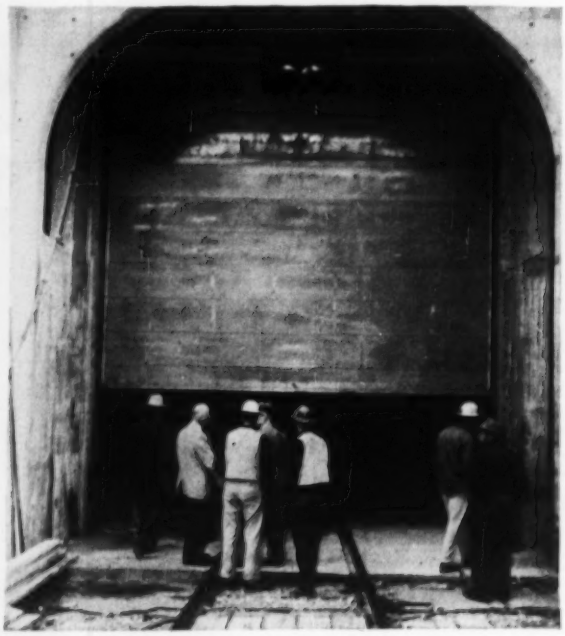
made it advisable to have a man on each drill. The same light drills—176 lb for drill and feed—were also used for all of the bench holes, but they were not used for the holes around the edges of the tunnel.

The principal disadvantage of the Blasjo cut appears to be in the throw of the rock, which was found to be in the neighborhood of 500 ft. To counter this, part of the right-hand wall in each round was left behind, and blasted simultaneously with the cut in the next round. This forced the rock to the left side, and reduced the length of throw. It was also found advantageous to drill two so-called "crack holes" in the center of the cut, and charge them with seven 1-in. cartridges of dynamite. This also helped to suppress the throw.

According to the Atlas Copco Co., whose drills were used on the job, the Blasjo cut was originated by O. Langefors of Nitroglycerin AB, which supplied the explosives to the contractor, Widmark & Platzer. In the opinion of Hjalmar Schibbye, site engineer for the contractor, the Blasjo cut should be particularly economical for tunnels ranging in widths from 10 to about 33 ft, where the rock has low blasting properties. For larger tunnels a V- or a fan-cut will probably be the better method to use.



INSTALLATION includes automatic controls, and two 250,000 cfm blower units that can ventilate the entire 7.8-mi tunnel.



KEY TO VENTILATION SYSTEM for railroad tunnel is this steel door at east portal, which closes to prevent circulated air from escaping before cooling engines.

Ventilation System Changes Cascade Tunnel Operation

Completion of a $650,000 ventilation project in the 7.8-mi Cascade Tunnel in Washington State, now enables the Great Northern Railway to terminate nearly half a century of electrified train operations and thus achieve what railroad officials said would be substantial operating economies.

Installation of the new ventilation system—really an engine-cooling system—was necessary to permit operation of heavy diesel-powered freight trains through the tunnel.

From west to east, the continuous rail within the tunnel is on a 1.57% grade. From the date of its completion (ENR Feb. 28, 1929, p. 334) diesel operation of full-tonnage trains was not practicable because of overheating of the engines.

Basic units in the ventilating project are two 6-ft fans at the tunnel's east portal and a steel drop door also at the east portal. Powered by 800-hp electric motors, the fans force fresh outside air through the tunnel at the rate of 525,000 cfm.

The steel drop door, actuated by the operator at the west portal, prevents the air blast from "short circuiting" or circulating out the near portal and back to the fan. A special control station near the east portal houses the fan motors, electric switchgear and control mechanism, as well as a 1200-hp diesel for standby power.

Operating procedure is this:

When a heavy tonnage freight enters the west portal of the 41,152-ft tunnel, an operator there engages a master control closing the east portal door and starting one of the fans. This forces 220,000 cfm against the train.

When the train approaches within 3,250 ft of the closed east portal, the door automatically opens and the fan shuts off. The fans will not operate without the door being closed, and a stop signal is provided in the event that the door should fail to open.

After the train has passed through the tunnel, the door automatically closes again, and both fans are started to change the air completely.

Lighter trains do not require help from the cooling system and all westbound trains, going downgrade, are able to operate efficiently without the aid of the fans. Some passenger trains have been diesel-powered through the tunnel for several years.

Design of the cooling system was based on studies made for the railway by the International Engineering Co. of San Francisco (Calif.), which served as consultants during construction by Morrison-Knudsen Co.

Constructing the new portal and door mechanism housing required close teamwork between the railway and the contractor. The top of the tunnel was within 18 in. of the 11,000-v trolley wire, requiring frequent interruptions of power energy. This was accomplished by installation of trolley terminals at each side of the door housing. Whenever power had to be cut, two hinged conductors were swung clear of each terminal plate and then reconnected when electric engines again could be allowed to pass.

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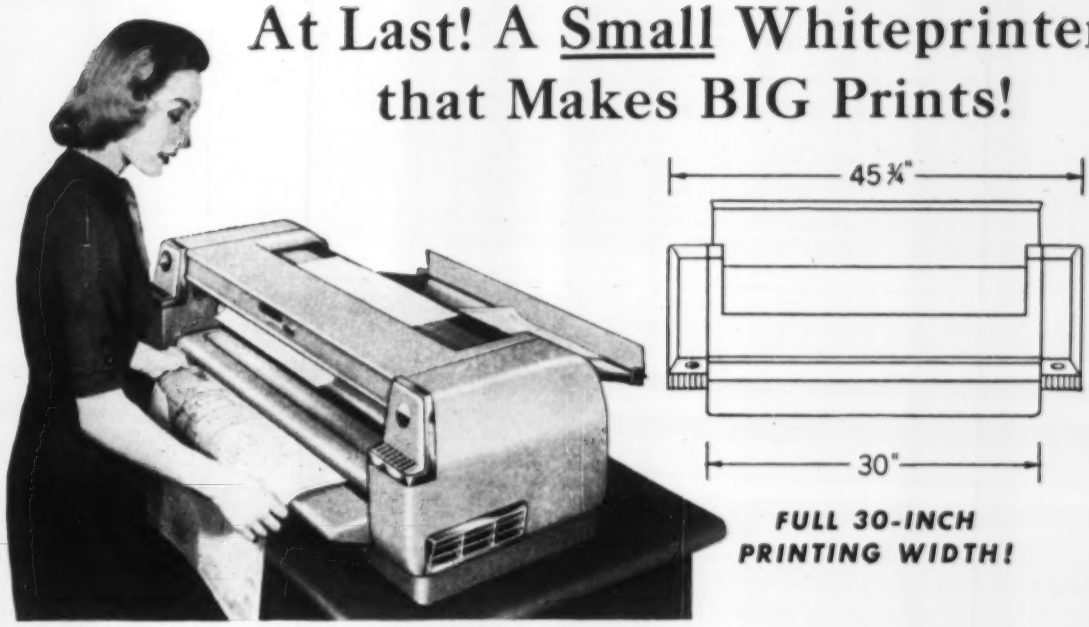

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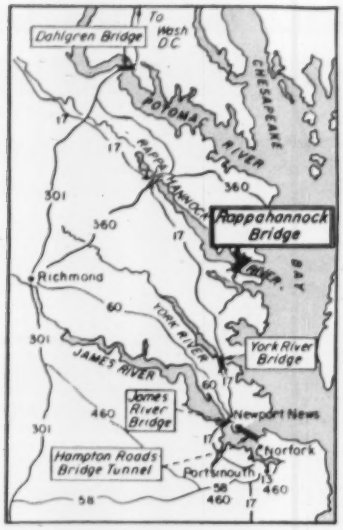
Structure 9,984 ft long will link Lancaster and Middlesex counties on opposite sides of the Rappahannock



TRANSITION is from beam spans on pile bents

Virginia Bridges Another of Its Broad

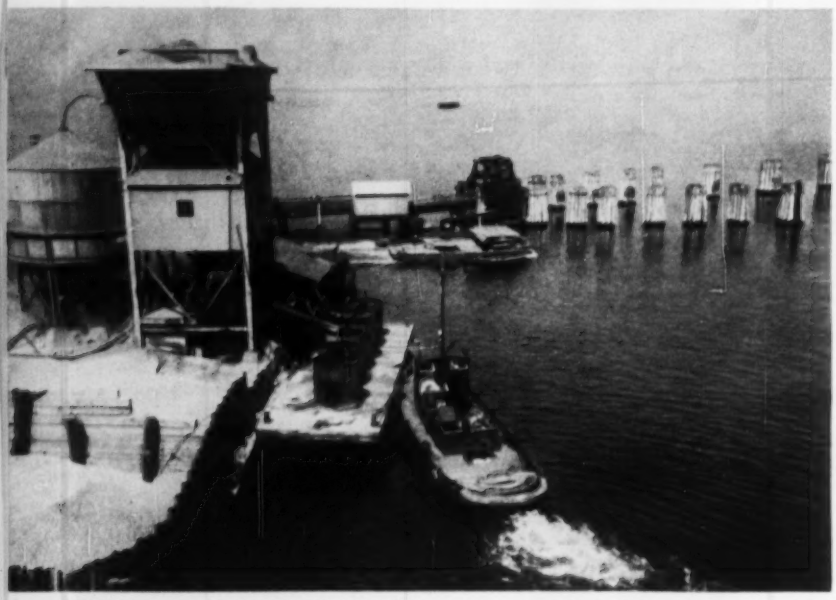
Pushing into the Rappahannock River between Grey's Point and White Stone, Va., is another high-level vehicular bridge planned to cut travel time along the state's singularly irregular coast line.

Larger than its somewhat similar predecessors—the crossing of the York River at Yorktown (ENR, May 8, 1952, p. 50) or the earlier Dahlgren Bridge across the Potomac River—this one, 9,984 ft long, constitutes the final link in a partly developed route skirting Chesapeake Bay between Norfolk and Dahlgren, to connect with an eastern by-pass of Washington, D. C.

The $15.5-million Grey's Point Bridge financed under a $95-million package bond issue with the Hampton Roads Bridge-Tunnel system (ENR Sept. 15, 1955, p. 30), will have a 22-ft roadway, and at its highest point will be 110 ft above the river.

The largest bridge ever built by the state's department of highways, it contains four different designs in substructure and three in superstructure. From embankment approaches, transition is from pavement on fill to beam spans to girder spans, thence to the main spans—deck trusses rising to a through truss of arched outline at mid-channel.

Substructure designs are for earth-fill embankment at each approach, concrete 7-pile bents, two-column pier bents supported on piles and 15 main piers on deep concrete-filled steel caissons. Last month, the thirteenth caisson was completed.



DREDGED-UP CONSTRUCTION PIER contains concrete batching plant at its deep-water end, serving caisson-bound barges, which load at pierside. Loading caisson-bound barges at pierside eliminates material rehandling.

• **Man-made work pier**—Projecting almost 700 ft from the end of the earthfill approach, is a storage-and-work yard, which was dredged up in 1954 and 1955. The rectangular area was first enclosed by a sheetpile cofferdam, then filled with dredged material.

The pier contains a concrete batch plant with two 2-yd mixers, stockpile facilities, a welding shop, storage area for caisson reinforcing cages, two railroad cranes and various storage and acessory buildings. Construction of the pier not only eliminated hauling and rehandling of batched materials, but allowed deep-water access to barges and tugs. The barges that now ply back and forth between caisson locations and the work pier carry six 4-yd buckets and are towed by diesel tugs.

to girder spans on pier bents, thence to 14 big deck trusses borne by 15 concrete filled steel caissons.

Rivers

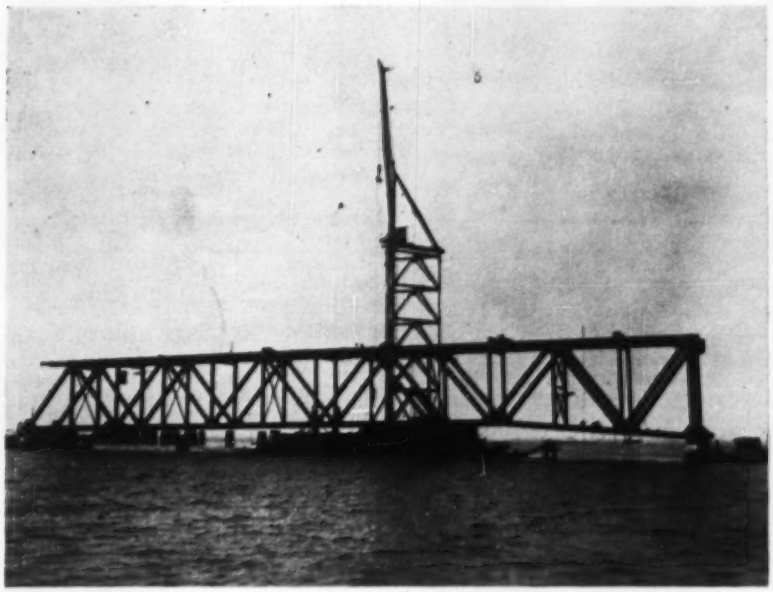
Buckets are emptied at the caisson site by barge-mounted derrick rigs.

• **Substructure operations**—The earthfill approach section is unusual only in its toe treatment. Enveloping the toe of the fill is a 10-ft concrete blanket that serves to hold the fill in place and to protect it in the event of high water.

Pile bents are conventional, with a reinforced concrete cap supported by two tripods of battered piles and a center supporting vertical pile.

Pier bents, too, are conventional two-column type supported by timber piles cut off at riverbed level. Footings were designed for 4-ft minimum depth below mean high water.

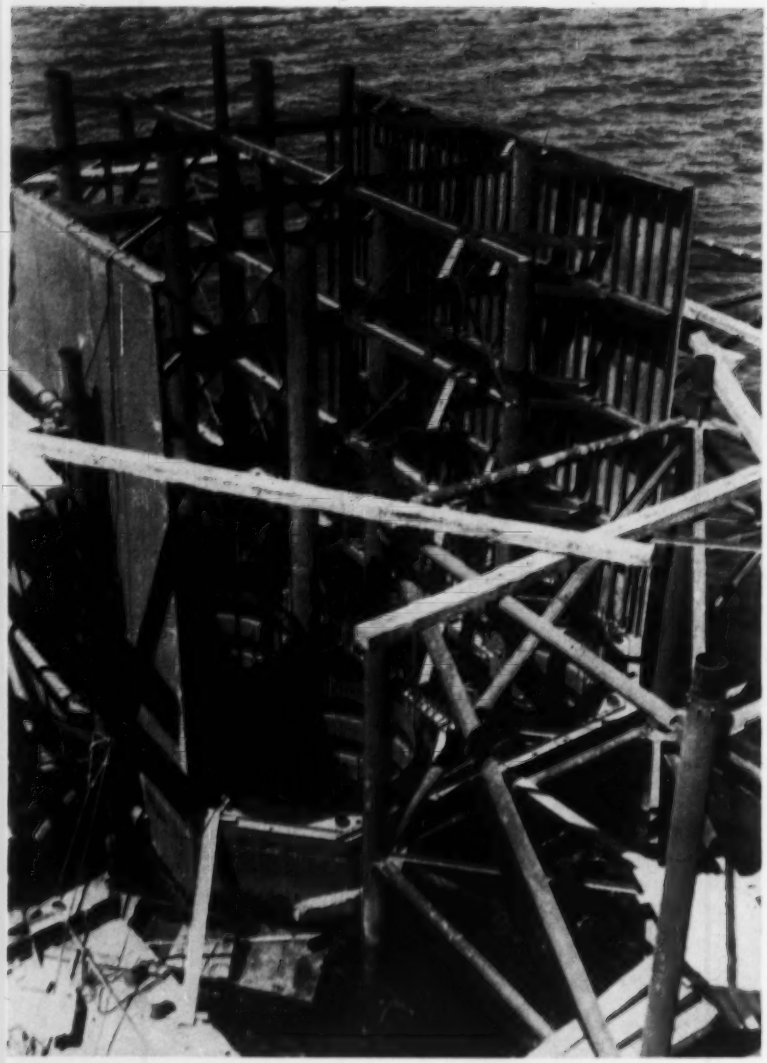
The deep water caissons range in size from 32 x 47 ft to 42 x 61 ft in plan dimensions. The deepest, located just north of the channel, goes down 153 ft to its bottom seal. Of steel, equipped with six dredging wells, the caissons were fabricated by the Newport News Shipbuilding & Dry Dock Co., and towed to the site, where



ERECTED IN PLACE by barge-mounted 35-ton derrick, the first completed truss span served later for . . .

OFF-BRIDGELINE ASSEMBLY of subsequent deck trusses on barges by a specially designed gantry rig. Falsework on barges is high enough for spans to be lowered into their places.

. . . Trusses are erected on barges



CAISSON UNITS—15 of them—are sunk to as deep as elevation —153 ft.

they were sunk by filling outside of the dredging wells with concrete, following procedures developed on the York River Bridge (ENR, Dec. 31, 1950, p. 32).

The caissons are topped off with 5-ft distribution blocks of concrete on which the pier shafts rest. The distribution blocks are at a depth of 38 ft below mean low water, so that the lower part of the pier shafts have to be built inside cofferdams built up from the caissons.

All substructure, with exception of earthfill approaches, is under contract with Diamond Construction Co., of Savannah, Ga. The approach piers and grading, finished in September, 1954, were by McLean Contracting Co., of Baltimore. Substructure construction is substantially completed.

• **Superstructure**—Bethlehem Steel Company's floating erection equipment, tested on the 4-mi Chesapeake Bay Bridge in Maryland (ENR, Jan. 8, 1953, p. 43) was reassembled for the Rappahannock River project.

The fleet, which will erect 12,855 tons of superstructure steel by job's end, consists of seven steel erection barges, a tower derrick on two other steel barges, a low derrick on still another barge and several launches and workboats.

Erection of the 14 truss spans is taking place on falsework assembled on barges anchored just off the bridge line. The spans are erected at an elevation higher than final elevations in the bridge to permit floating into place, and lowering by flooding barge compartments. Pumps are installed in addition to flooding valves, so that barges can be raised also, if necessary, while placing trusses on their bearings.

The first span, already in place, is a 351-ft, 560-ton unit, which was assembled on two steel barges by a 35-ton stiffleg mounted on a derrickboat. The largest span will be 468 ft long and weigh 900 tons. It and the other 13 truss spans will be erected by a gantry rig, set on the completed first deck-truss span and able to reach over to the falsework-equipped barges secured alongside. The gantry mounts a 35-ton stiffleg derrick with a 100-ft boom and a 6-ft jib. The derrick stands on an underframe specially built for the job.

Falsework on the barges is raised for each successive span until—for the two highest flotations—spans will be assembled 70 ft above barge decks. Four barges will be used to float the largest and longest spans into place. All other truss spans will be erected on two-barge assembly rigs.

While erection of spans is being carried on, a tower derrickboat will erect a cantilever arm beyond the pier on which the last span has been set. Then, when the next span is ready, it will be floated in between the end of this cantilever arm and the next pier. The procedure will be repeated for all except the channel span.

Using the tower derrick, this span will be cantilevered from Piers 9 and 10 and joined at midpoint to form a span 648 ft long.

Bids have been called for the two final contracts on the bridge project. One is for widening approaches on both the White Stone and Grey's Point sides of the river, and the other is for toll plazas, an administration building and toll collection facilities on the White Stone side.

The bridge, over which there was a question of feasibility at the time of its proposal, will replace a ferry service, which has been operating at a loss for many years. It was the fear that traffic would not justify construction of the toll project that forced its inclusion with the Hampton Roads Bridge-Tunnel bond issue.

The bridge is scheduled to open in the fall of 1957, according to William R. Glidden, who is assistant chief engineer of the state's department of highways.

Superstructure steelwork is being fabricated at Bethlehem's Pottstown, Pa., works and transported by rail to Baltimore Harbor, where it is transferred to barges and towed to the bridge site.

John Mcgonigle is Bethlehem's resident engineer and C. L. Stroble is superintendent. Consultants on the project are Modjeski & Masters, Harrisburg, Pa., with R. P. Holley as resident engineer.

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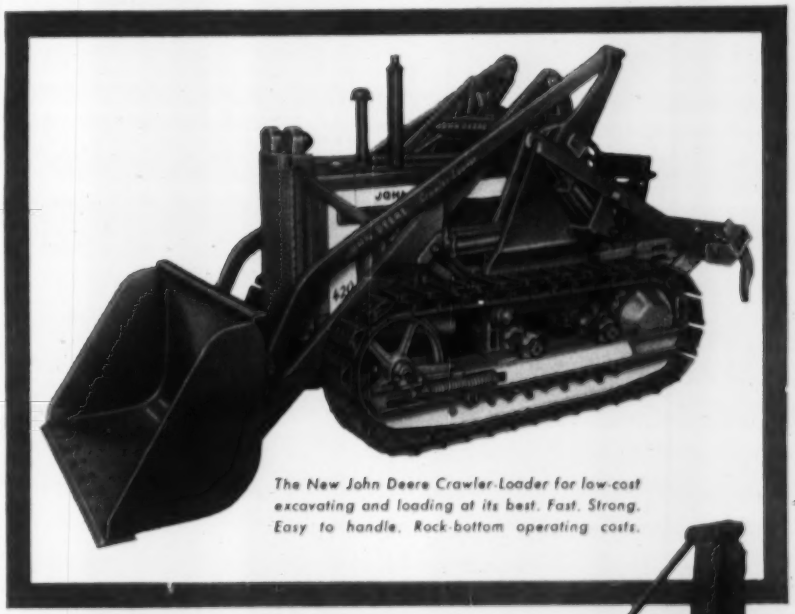

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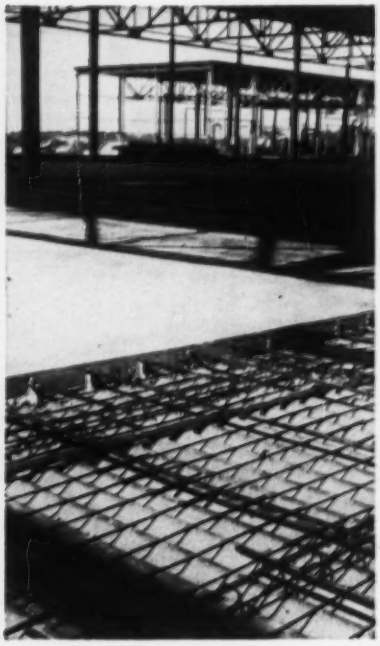

REINFORCED CONCRETE design principals are used with Cofar and negative steel is added for slab continuity. High-strength Cofar units are suitable for steel or concrete frame construction. Attractive underside can be left exposed.

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Deep-corrugated Cofar steel units (with transverse wires welded across corrugations) completely eliminate wood forms . . . make concrete floor and roof construction a *one-step* operation. Cofar offers in one product all the positive and temperature steel needed in the structural concrete slab.

Architect's on-the-job representative, Harold G. Haddon of Smith, Hinchman and Grylls, Inc., Detroit, says, "Working with forms seems so outdated now. Metal forms, such as Cofar, are among the most timesaving products we have in construction today. They immediately follow structural steel erection, eliminate the cost of forming and provide a good platform for working trades. Workmen can move in immediately, can start placing on the second floor while there's still activity on the first . . . and there's no danger of falling materials. Our jobs seem to go twice as fast now!"

Consider the advantage of an immediate working platform: In the Lincoln Plant at Novi, Mich., there are over 50 underground machinery pits. Workmen safely poured these pits at the same time Cofar was being placed on the floor above! Consider the time saved with *no wood forms* to cut, fit, remove, repair and store. Doesn't it make sense to use a product that saves you time, work, money and speeds occupancy. Cofar does them all! For more facts, consult district or home office. ATTN: Dept. E-66.

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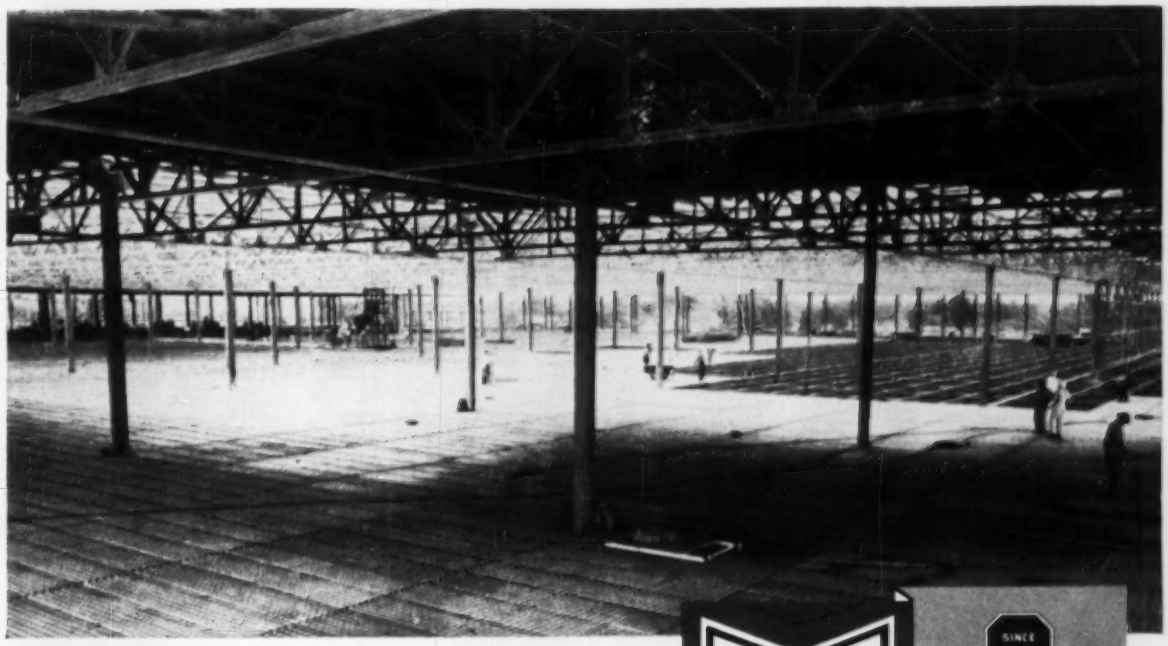

MORE THAN 318,000 SQ. FT. of 24-gage Cofar has been placed on the second floor and on fan and transformer rooms of the new Lincoln plant in Novi, Michigan. Cofar deep-corrugated steel units provide main reinforcement. T-wires, welded across corrugations, provide composite temperature reinforcement, mechanical anchorage and shear transfer from concrete to high-strength Cofar steel.

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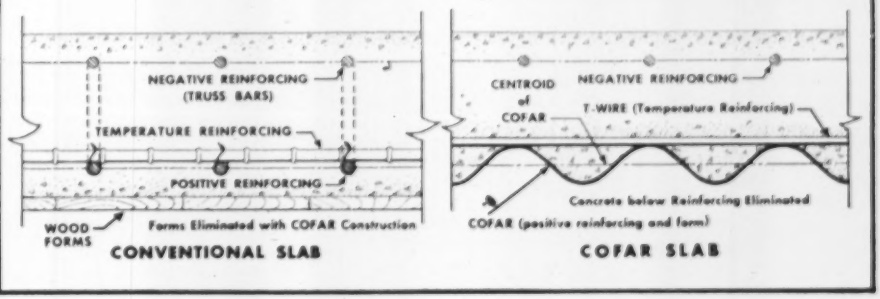
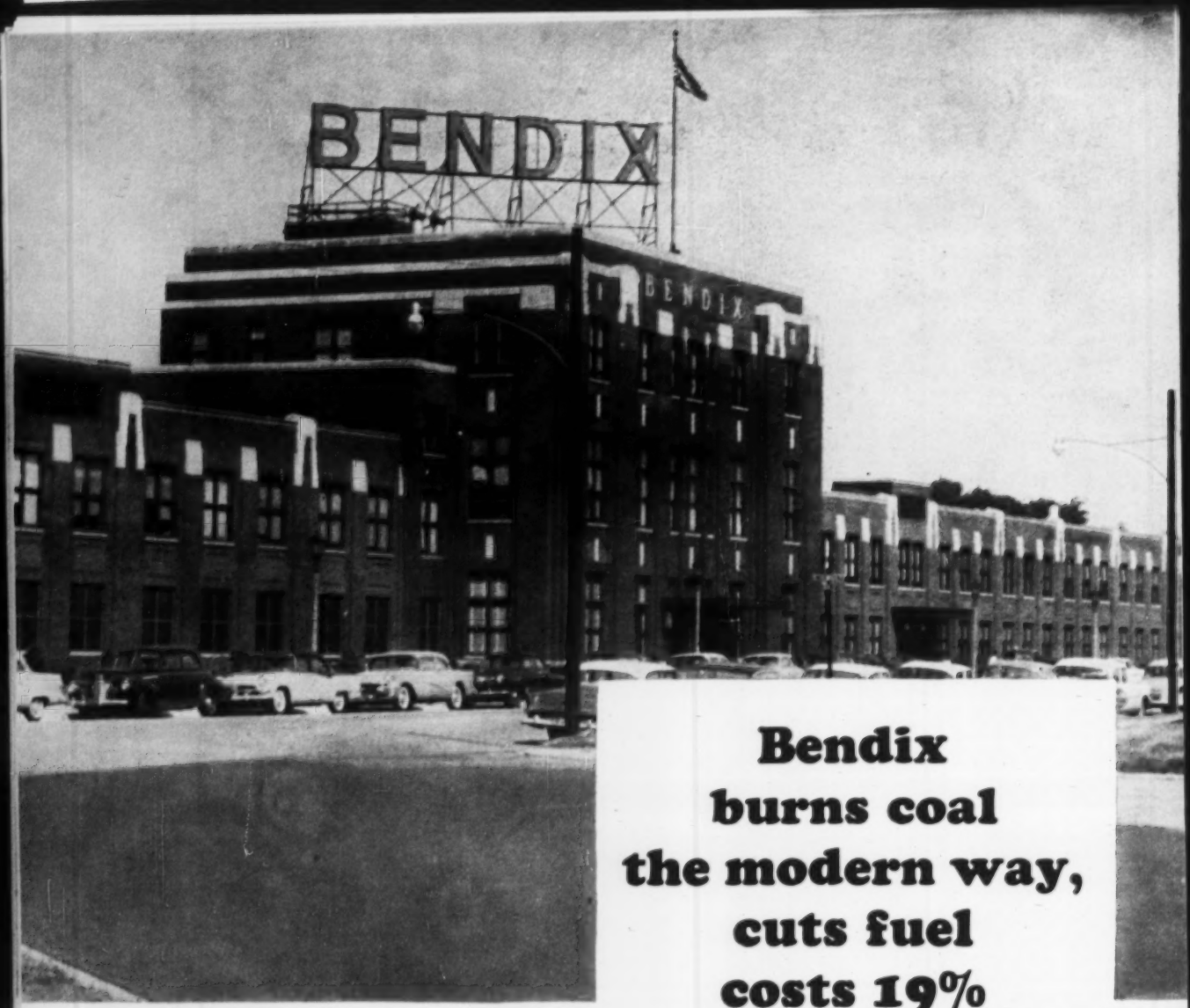
Read what members of the construction team say about Cofar:

GENERAL CONTRACTOR'S superintendent, Mike Kopko of W. E. Wood Company, says, "Speed is the essence of everything here and that's what Cofar gives us—speed! It covers a lot of area, provides a safe, solid, working platform. Trades come in and proceed with their jobs fast. We're getting nice level floors, too. With Cofar you haven't got the T-shores, forms, clean-up after pouring, loose concrete chipping away beneath and cement patching. This is the first Cofar job for all my men. They like it!"

COFAR ERECTOR, Ray Ewer of Capitol Erection and Welding Company, says, "Ford is very happy with Cofar. Cofar was here in plenty of time. The sheets handle easily and placing is fast. Cofar 'cuts in' nicely and takes a lot of beating. I had visions of needing something to plug leaks but we've had no trouble with pour leaks or concrete finishing. We're going a little faster all the time."

Diagram Shows Comparison of Conventional and Cofar Slab Sections





Bendix burns coal the modern way, cuts fuel costs 19%

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facts you should know about coal

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At its Products Division, South Bend, Ind., Bendix Aviation Corporation undertook extensive modernization of its power system. The firm replaced two 511 HP boilers with two 80,000 lb./hr. spreader stoker fired units. A 500-ton overhead bunker and coal elevator-conveyor system were installed. Additional changes were made including an increase in the capacities of the water and air systems.

Today fuel costs at Bendix have been cut 19%, efficiency boosted from 70% to 82%, maintenance costs lowered 80% and availability upped from 50% to 96%. By burning coal the modern way, Bendix is saving many thousands of dollars yearly and will amortize the cost of modernization in a comparatively short time.

For further information or additional case histories showing how other plants have saved money burning coal, write to the address below.

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Europe's Largest

Suspension bridge across Seine River is started

Construction of the biggest suspension bridge in Europe was started on Oct. 23 in Tancarville over the Seine River, 15 miles upstream from the Port of Le Havre.

The bridge will have a main span of 2,000 ft whose 60-ft-wide roadway will be suspended 165 ft above the water. Total length of the bridge will be 4,640 ft. The towers will rise to a height of 390 ft and 27-in.-dia cables will be used. Cables will weigh 1,500 kilograms to the meter. Construction will require 15,000 tons of steel, exclusive of cable wire, and 75,000 cu yd of concrete.

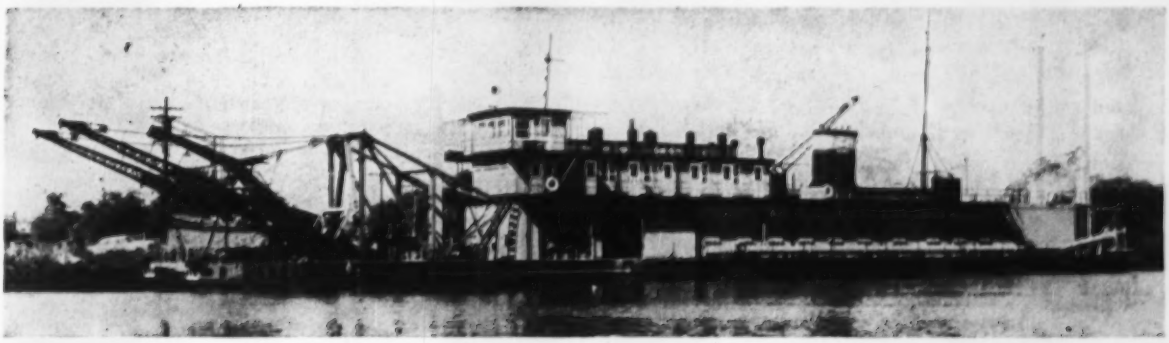
Five hundred workers will take over three years to complete the bridge, according to present estimates. Cost of the construction will be over $11 million, to be amortized by toll charges. The bridge will be a concession of the Le Havre Chamber of Commerce for 75 years and will then become government property.

Prime contractor for the bridge is Schneider et Compagnie, a leading French construction company.

Steel Bridge for Ecuador

A new steel bridge at Quevedo, just completed by a U. S. engineering firm, is hailed as an important step in construction of Ecuador's highway system to connect the Pan-American Highway in the mountainous interior with the Pacific Coast ports of Manta and Guayaquil. The bridge eliminates a ferry system that could only be used during high water, and fording of the stream during low water.

J. A. Jones Construction Co. was contractor for the structure.



Colombia Buys Dredge for River Navigation Work

As a part of its program to improve navigational use of the Magdalena River, the Republic of Colombia has purchased one of the world's largest floating dredges.

According to the Colombian Ministry of Marine, the dredge will be used to straighten the winding course of the river, and to eliminate numerous small sandbars and islands. Principal purpose, however, will be to deepen the river's channel so that navigation is possible at all times of the year. Six of the country's major ports are located on the river.

Manufactured by the Ellicott Machine Corp. of Baltimore, the new dredge—known as M.O.P. DH-6 Adenavi—has overall hull dimensions of 200 ft by 44 ft, and draws 7½ ft of water. It is self-propelled by dual propulsion motors that enable it to achieve a speed of about eight knots when moving from one dredge operation to another. The dredge, however, will be towed to Colombia in the near future.

Chief among unusual design characteristics of the new craft is its adaptation for use as both a "dustpan" and cutter head dredge. The "dustpan" dredge is equipped with a wide suction head, similar to a household vacuum cleaner, and is fitted with a system of hydraulic jets. With this attachment and the jets cutting ahead of the dustpan, the dredge can dig to a depth of 26 ft and can make a longitudinal cut or trench about 30 ft wide and 2,000 ft long. When it becomes necessary to dig clay and compacted gravel, or cut channel through land areas, the dredge reverts to the cutter head type simply by switching the dustpan attachment for the cutter—an operation

. . . insure the *COMPLETE* containment of water, wastes, sludges and sewerage in . . .

- **IRRIGATION PROJECTS**
- **INDUSTRIAL RESERVOIRS & WASTE CONTROL PONDS**
- **MUNICIPAL WATER AND SEWERAGE PROJECTS**
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"Hydromat" hydraulic mats, developed and manufactured by the leading manufacturer of asphaltic products for over 30 years, were developed in a scientific manner to provide a lining material that would allow the COMPLETE containment of water, wastes, sludges, sewerage, etc. "Hydromat" is installed as a monolithic liner, with mechanically sealed joints, that will expand and contract with soil movements without rupturing or breaking the seal. "Hydromat", a fully exposed type of lining, may be installed quickly and easily by untrained labor . . . make-ready requires only a minimum of time and effort. "Hydromat" provides the practical answer to the problem of efficiently relining old, cracked concrete or gunite linings. "Hydromat" hydraulic mats are produced in sheet sizes 4' wide up to 12' long . . . available in thicknesses of 5/32", 1/4" and 1/2".

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that takes about a half day. Used as a cutter head dredge, the machine has a digging depth of 33 ft.

Buenos Aires to Spruce Up Main Street and Slum Area

Building projects planned or already under construction in Buenos Aires will dress up the main street of the Argentine capital and refurbish a large section of rundown back streets at a total cost of $149 million.

Urban renewal will take $139 million of the sum. Under architect Antonio Bonet, an architectural and city planning group has worked out plans, diagrams and models for rebuilding an 80-block area presently occupied with small businesses, warehouses and substandard dwellings. Meantime, Avenida Corrientes, the city's principal thoroughfare, is slated for a $9.6-million face lifting in the next year. One building is rising now and two others are scheduled to get under way shortly.

Existing buildings in the area marked for renewal will be replaced with 16-block neighborhood units, each containing housing for 75,000 people. Commercial and cultural activity buildings will be 1 or 2-story structures. Apartment houses will range from 11 to 36 stories. Financing has not been completely worked out, but new construction will probably be carried out by private capital with aid from the Argentine National Mortgage Bank, which ordinarily lends about $275 million a year in the entire country to foster housing construction.

Already under construction on the Avenida Corrientes is an 18-story telephone company building that will cost an estimated $4.3 million. A block away a 14-story shopping center and office building with a budget of $1.4 million is due to be started soon. This building will feature a rooftop heliport.

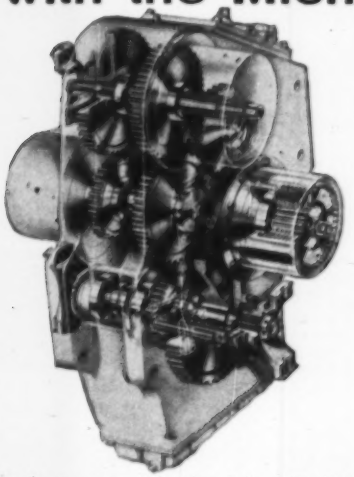
Possible Effects on Channel Holds Up B. C. Tunnel Work

An unexpected development is holding up start of construction on the British Columbia Government's planned $15-$17-million four-lane tunnel under the Fraser River at Deas Island.

The federal government's harbor commission said in mid-October that it is withholding approval of the tunnel—a vital link in a proposed $30-million highway system connecting Vancouver to the U. S. border—until tests have been made to determine what effects the tunnel could have on deep-sea shipping in the river. Orig-

Michigan's speed boosts output even on toughest assignments. Top is 27 mph. Photo comes from job near Duluth, Minnesota.

You'll cut your dozing time
with the Michigan Power-Shift Transmission



Here's the secret of Big Time-Savings: the Michigan Power-Shift Transmission! Forward-Reverse and High-Low gears are in constant mesh. Shifting is accomplished by hydraulic pressure. Power-shift levers on steering column actuate control valves in transmission. These valves direct oil pressure to multiple-disc clutches which transmit engine power from selected drive gear to output shaft. Hydraulic oil completely lubricates all drive gears and bearings as it flows from top to bottom, returning to sump through fine-mesh screen.

Operating a Michigan Tractor Dozer is both fast and easy. Gone is the old-fashioned heavy-duty foot clutch; gone is the tiresome work of clutching every time you shift gears.

The Michigan Power-Shift Transmission does *all* the work for you. All you do is operate finger-tip hand levers on the steering column . . . one for Forward-Reverse, one for High-Low speed. *Make either shift while moving in either direction without coming to a stop.* Doze material where you want it, flick the lever, and almost instantly back up. Torque converter takes up *all* shocks . . . so you speed operations, cut dozing time, get top yardage every day.

For proof, get a demonstration right on your own job. It is easily arranged: just phone your Michigan distributor. Ask him, too, about the Clark Leasing Plan which lets you put a Michigan Tractor Dozer, Michigan Tractor Shovel, or Michigan Excavator Crane on your job without paying out a cent of capital.

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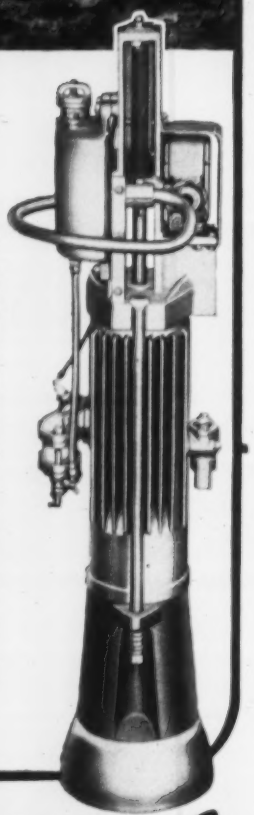
Ask for a Demonstration—We will be glad to arrange a demonstration for you; see our nearest distributor or write. SEND FOR A COPY OF CATALOG 621.



BARCO *Manufacturing Co.*

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inally, the B. C. Government had announced that the tunnel might go under bids before this coming summer so that work could begin as soon as possible. An engineering contract had been awarded to Foundation of Canada Engineering Corp., of Vancouver.

Harbor commissioners and their engineers, after studying the tunnel plans, said they felt it might have an adverse effect on shipping in the river, even though the site is one of the deepest parts of the stream.

Turkey Reports on Work To Modernize Seaports

The story of how Turkey is overhauling its system of ports and harbors by work on eleven major projects costing about $96 million is detailed in the August issue of "World Ports", a report by the American Association of Port Authorities.

During the past six years, the report says, scope of Turkey's port development has been enormous. Included are ports of Mersin, Iskenderun, Samsun, Salipazari, Haydarpasa and Izmir.

Shipbuilding Yard for Egypt Attracts Four Offers to Build

The Egyptian government has received four offers—from Poland, East Germany, Denmark and West Germany—for construction of the $10-million shipbuilding yard at Alexandria, just west of the present harbor.

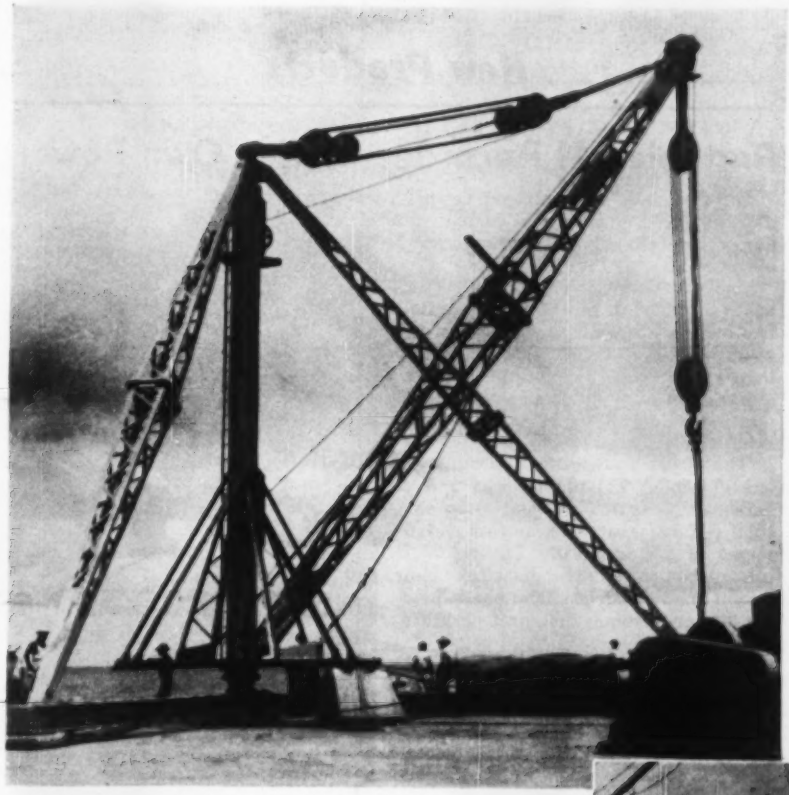
An earlier offer from a group of British firms has been withdrawn. The other offers have been referred to technical committees at the National Production Council for study, including the mode of payment.

The proposed shipbuilding yard will take three years to finish from date of signing of the contract.

According to the NPC's plan, the total tonnage of ships to be built in the yard annually will be 50,000. For this, the yard will use up 15,000 tons of steel, to be produced locally.

In addition to repairing existing ships, the proposed shipyard will be able to build ships for the Egyptian coast guards, the ports and lighthouse administration, and the fisheries department, according to an NPC spokesman. He also stated that the facility will provide work for 4,000 skilled workers.

The yard will also supply "vessels required by Egyptian shipping companies and oil tankers required by the government and Egyptian oil companies, as well as fishing fleets for the Mediterranean and the Red Sea."



At Modern Great Lakes Ports, at leading Ocean Ports of the World . . . and now at Guatemala's new Atlantic seaport of SANTO TOMAS

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CUTS CARGO HANDLING COSTS!

Any way you look at it, cargo handling is overhead, a necessary subtraction from the profits a carrier or port can earn. That's why so many progressive ports depend on the economy of Clyde equipment to keep cargo handling costs down to a minimum.

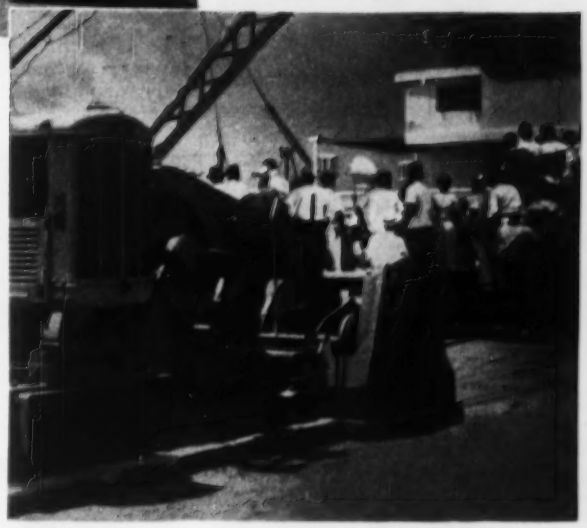
Economy of hoist operation is obtained through the use of anti-friction bearings that reduce power consumption by utilizing the full efficiency of the power unit.

Clyde's clutch and brake designs effect additional economy by giving the operator safe, accurate load control with remarkably little effort and permit fast cycle work, hour after hour.

Economy of maintenance is assured by using the finest materials available, thereby reducing costly down times caused by adjustments or repairs.

Clyde derricks also make a substantial contribution toward cutting the cost of material handling. They are designed to be lighter but stronger, and fitted with anti-friction bearing sheaves, permit heavier pay loads to be handled with less horse power than other, out-moded derricks.

If cargo or material handling costs are your problem, why not check with Clyde. Get the complete story on how Clyde equipment can save you time and money. You will discover savings that will surprise you.



Pride of Guatemala's new Atlantic seaport of Santo Tomas is this new Clyde steel derrick operated by a Clyde gasoline hoist. Citizens of Santo Tomas turned out en masse for recent dedication ceremonies to watch the Clyde unit load the first ship with sacked zinc and lead ore for shipment to the United States.

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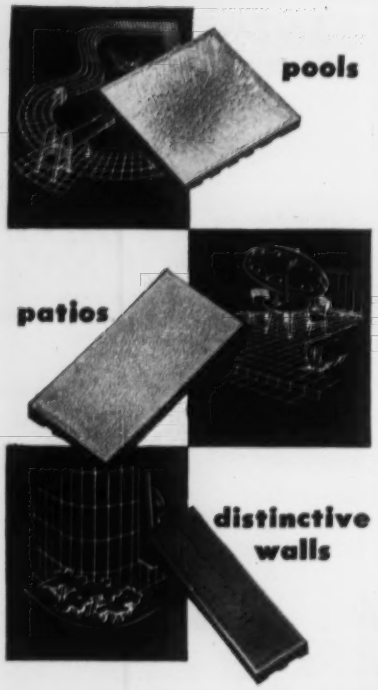

Summitville Glazed Quarries have all the rugged characteristics of Quarry tile, long famous for unequalled strength and durability. To these inherent qualities, Summitville has added beautiful ceramic glazes in a wide variety of colors and textures.

The new glazed quarries are waterproof and frostproof which makes them especially adaptable to exterior use. Suggested applications for glazed quarries include light duty floors, patios, feature walls, counter tops, store fronts and swimming pools.

Contact your Ceramic tile contractor for samples and full information or write to...

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TILES, INC.
SUMMITVILLE, OHIO

New Products

Portable pH Recorder Carries Own Power

Portable and self-contained, a pH measuring and recording instrument requires no external power supply for operation.

The new device is recommended for field surveys of stream pollution, waste-treatment plant effluent and industrial water supplies. It may also be used for in-plant studies at locations where a permanently mounted pH recorder is not desired, or where power is not readily available.

The device consists of two units—a Bristol Model 524 pH recorder and a Beckman N-2 amplifier—and covers the total pH range of 0-14 in two partial ranges of 0-8 and 6-14. The recorder uses carbon-coated 8-in.-dia charts and a vibrating-type stylus. The chart drive can be set to rotate the chart in either 1 hr or 24 hr.

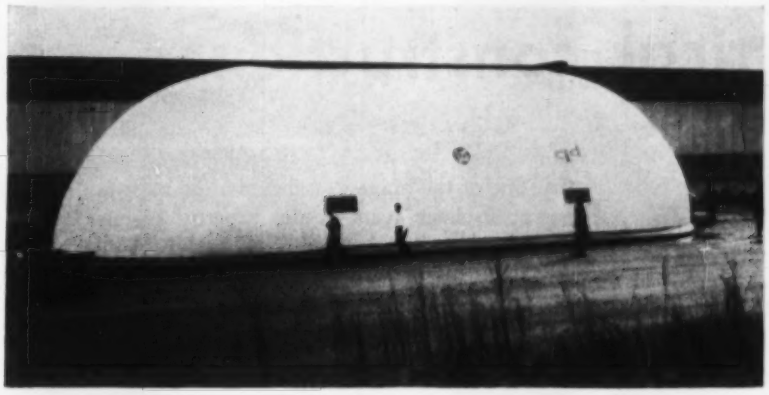
Temperature compensation is made by means of a manual adjustment, after reading the temperature of the liquid being tested.

For easy transport, the units are compact and together weigh 50 lb. Various types of electrodes are available, including those for immersion, flow, and laboratory applications. The Bristol Co., Waterbury 20, Conn.

Torque Converter Added to Motor Grader Line

A new addition to the Adams line has been announced by LeTourneau-Westinghouse Co. Designated as the Adams Power-Flow 660, the unit is basically the same as standard model 660, with the additional advantages of a torque converter drive train plus a 27% increase in engine power.

The Power-Flow grader teams a 190-hp diesel power plant with a single-stage torque converter and four-range constant mesh transmission. Tripling available torque, the manufacturer says, this drive provides the equivalent of an infinite number of gear ratios which adjust automatically to variations in load requirement. LeTourneau-Westinghouse Co., Peoria, Ill.



Air Holds Up Warehouse Roof Walls

A portable inflated warehouse displayed for the first time this month is completely frameless and non-rigid. Supported entirely by low air pressure supplied by a centrifugal blower, the structure is a vinyl-coated nylon bag, shaped like a sausage split down the middle.

The display model, reportedly erected by three men in one hour, is 20 ft high and covers an oval area 80x40 ft. A water-filled tube, 15 in. in diameter, made of the same fabric, forms the base perimeter and anchors the building.

Inside pressure can be as little as ¼ oz per sq in. (3 psf)—higher for snow or other loads. The blower can maintain enough pressure, according to the manufacturer of the warehouse, to hold the building in shape even when the door is opened to admit forklifts or other equipment.

The warehouse is reported to weigh 400 lb (the fabric weighs 8 oz per sq yd). Deflated, it can be folded into a bundle 5 ft long and 3 ft wide.

U. S. Rubber Co. developed the building for a Chicago firm, Calumet Industrial District. Including the blower, it will cost approximately $2,000 in the size displayed. Other sizes will probably be manufactured. Besides selling the product (tradename, Airhouse), Calumet expects to lease it as a package deal—erection, maintenance and removal. Calumet Industrial District, 1501 E. 96th St., Chicago, Ill.

Adjustable-height tripod offered

A portable tripod with telescoping legs that adjust heights from less than 8 ft to 14 ft has been announced by the B. E. Wallace Products Co. The 80-lb tripod, which can be carried in a panel truck or station wagon, is of rustproof construction and has a capacity of 1½ tons. Height-adjusting bolts are self locking, freeing both hands for setting the legs. A special attachment converts two legs of the tripod into an A-frame. B. E. Wallace Products Co., Exton 20, Pa.

Aluminum-Treated Tarpaulin Is Fire and Rot Resistant

AlumiFlame is the name of a tarpaulin that has been subjected to a fire-resistant process along with an aluminum treatment. The aluminum treatment results in ease of handling, light reflection and heat retention according to the manufacturer; and they remain flexible in cold weather.

Water and rot resistant, the tarps have rope-in-hem construction for added strength. They meet fire-resistant requirements of Federal Specification CCC-D-746. Individually packed, they have an identification nameplate, and a name patch sewed in one corner is for use on the job. H. Wenzel Tent & Duck Co., 1035 Paul St., St. Louis, Mo.

(*New Products continued on page 71*)

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Save money

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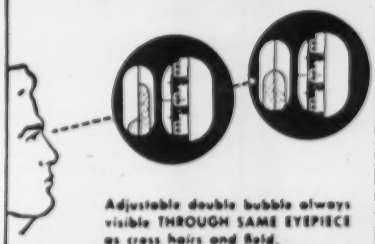
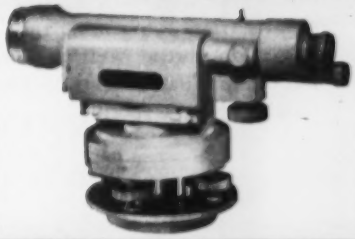


Adjustable double bubble always visible THROUGH SAME EYEPIECE as cross hairs and field.

DOUBLE BUBBLE



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NAME.....

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How can you simplify electrical details of a public works project?

By planning an electrical system around the one product line that includes *everything* electrical . . . each product made with the other in mind. That's Westinghouse.

This means perfect integration, freedom from costly fitting on the job. It means elimination of extras and misfits. It results in a finished job that is sound, snug and simple compared to any assembly of miscellaneous brands and qualities.

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By using the services of Westinghouse field specialists in planning a system precisely to fit the need. This teamwork approach to the job can mean savings in planning time. Skillful application of the broad Westinghouse product design can cut installation costs . . . often saves on space required by the specified apparatus. Chances are that one of the biggest savings will be most apparent in later years as the expertly planned system proves its adaptability to growth in any direction.

There's a Westinghouse electrical construction specialist as near as your telephone. Call him. He can demonstrate how to simplify and save on your next public works job. Westinghouse Electric Corporation, P.O. Box 868, Pittsburgh 30, Pa.

1. More than 100 motor drives are controlled at the City of Houston Water Works by this Westinghouse control center 2. Heavy-duty Westinghouse motor driving air compressor unit. 3. Motor driving freight elevator at the City of Cincinnati Little Miami Sewage Treatment plant. 4. Low-voltage drawout switchgear in municipal building protects branch circuits and equipment with Westinghouse De-ion® circuit breakers. 5. City of Houston Water Works carries high-voltage power close to load areas with Westinghouse totally-enclosed power centers. 6. Highway lighting — Westinghouse OV-20 mercury vapor lighting units on the New Jersey Turnpike.

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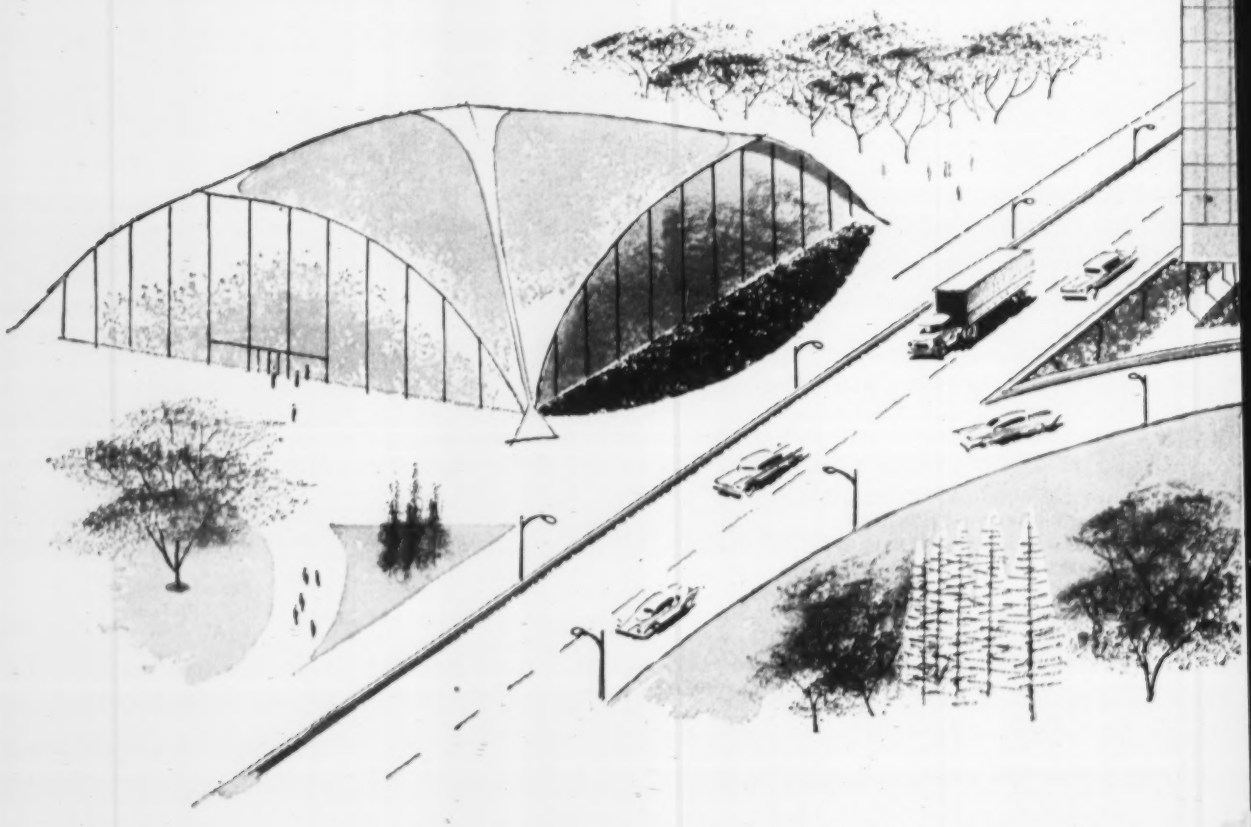
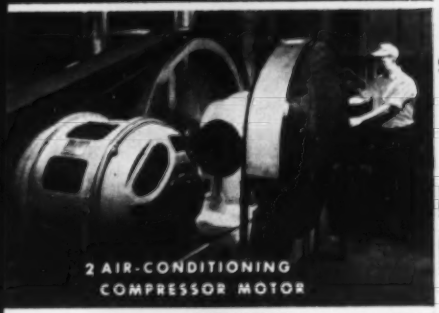


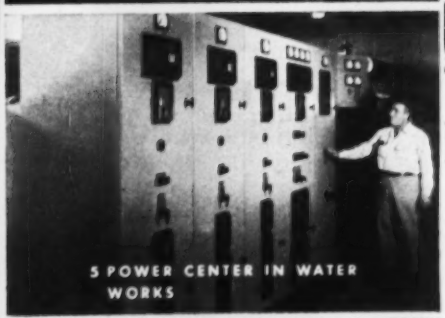
1 WATER SYSTEM CONTROL CENTER



2 AIR-CONDITIONING COMPRESSOR MOTOR

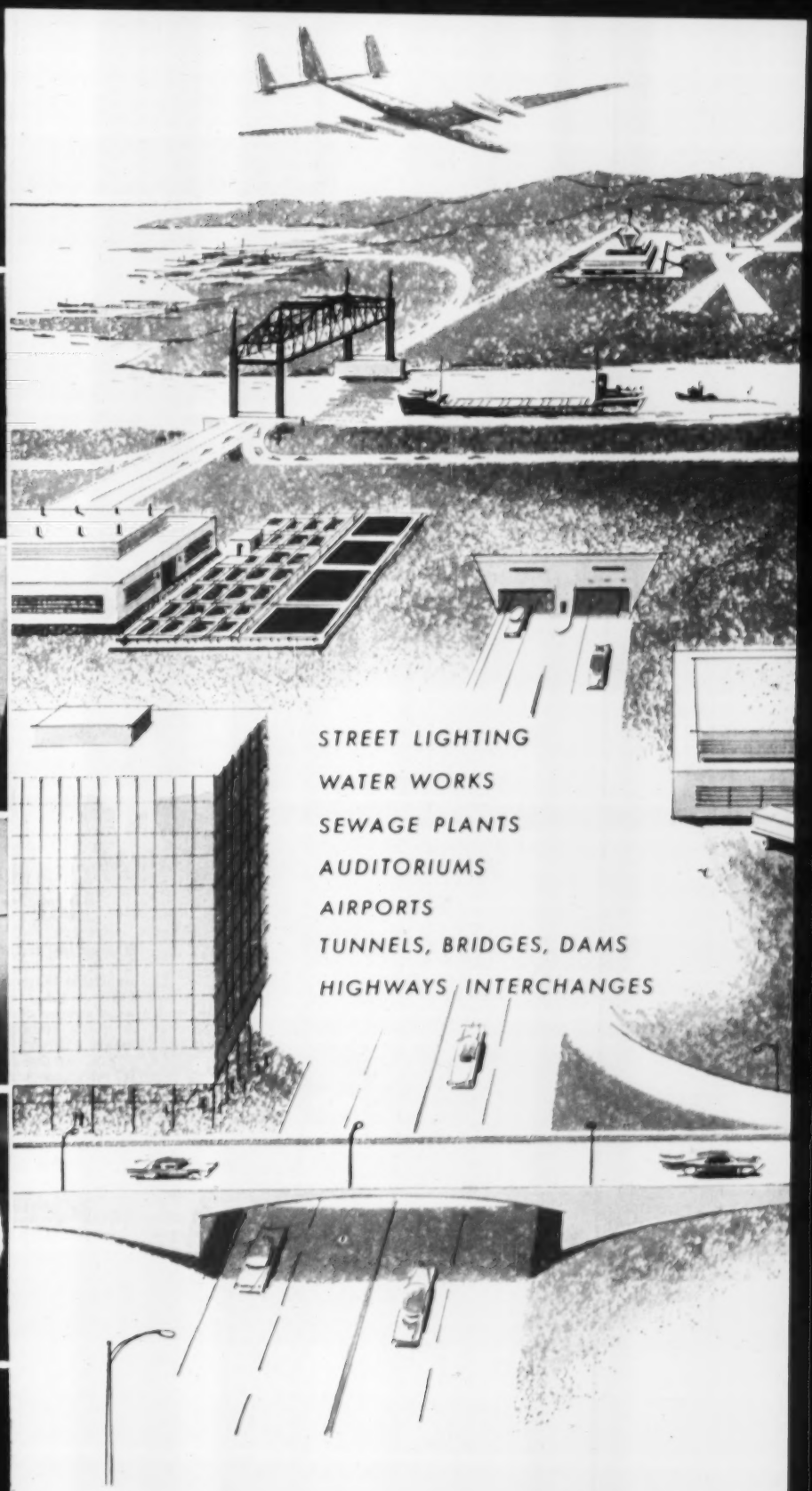
3 MOTOR DRIVE IN SEWAGE PLANT

4 MUNICIPAL BUILDING SWITCHGEAR



5 POWER CENTER IN WATER WORKS

6 HIGHWAY LIGHTING



STREET LIGHTING
WATER WORKS
SEWAGE PLANTS
AUDITORIUMS
AIRPORTS
TUNNELS, BRIDGES, DAMS
HIGHWAYS, INTERCHANGES

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Rained last night . . . rained the night before . . . but this job stayed on schedule. Reason? Two dependable Homelite pumps saved the day for work. Only one man needed to carry these gasoline engine driven units to the best pumping location. A quick start and dependable pumping action makes short work of rain or seepage problems.

You can do something about the weather and do it fast when you have a Homelite carryable pump. No waiting for bulky equipment . . . no loss of job time and money due to work stoppages. Ask your Homelite Representative for a free demonstration or write us for the details.

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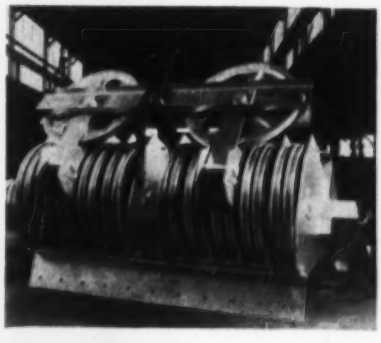
Shock Waves Are Used In Electric Rotary Hammer

An unusual portable electric rotary hammer that uses shock waves is now available.

The manufacturer says that the machine creates over 36,000 shock waves a minute and cuts a clean, true hole up to 40 ft in depth through the hardest stone or even reinforced concrete. Weighing about 10 lb, the machine is said to require no pressure and handles difficult overhead or horizontal work with ease. Demo-Haines Tool Corp., North 10th Machine Works, Enid, Okla.



Sheave Block Assembly

A 300-ton-capacity multiple-sheave system has been designed for use in self-unloading boats. The assembly will be combined with two 12-sheave-block assemblies consisting of ten 40-in. roller-bearing sheaves and two 40-in. bronze-bushed load sheaves. Sauerman Bros. Inc., 620 S. 28th Avenue, Bellwood, Ill.

Plastic-Base Coating Looks And Performs Like Porcelain

Pittsburgh Plate Glass Co. now markets a baking enamel called Duracron that the company says performs and looks more like porcelain than any other known organic finish. Based on a new series of thermosetting acrylic resins, the material is exceptionally resistant to overbake, chemicals, detergents, humidity, salt spray and grease, according to the manufacturer. It is also described as tough, flexible, hard and mar-resistant.

Intended uses include the finishing of refrigerators, home-laundry equipment and other items requiring a baked-on coating. But the manufacturer is checking on other possibilities. Outdoor weathering tests, for example, have been under way for some time to find out whether Duracron can be applied to building panels.

Cost of the material runs a little higher than ordinary baking enamel, but Duracron more than cancels the disadvantage, according to the manufacturer, by doing with one coat many jobs that would otherwise require two. Pittsburgh Plate Glass Co., 632 Fort Duquesne Blvd., Pittsburgh 22, Pa.

AC Electric Cooler For Jobsite Shacks

Ease of installation, portability and small size make a new water cooler especially adaptable for use at engineering and construction field offices, according to its manufacturer.

Weighing only 70 lb, the unit requires no plumbing and can be connected to any 115-v, 50 or 60 cycle AC line. It can be operated from any generator with sufficient starting power to operate the cooler's ½-hp compressor, making the unit available even where regular power is nonexistant.

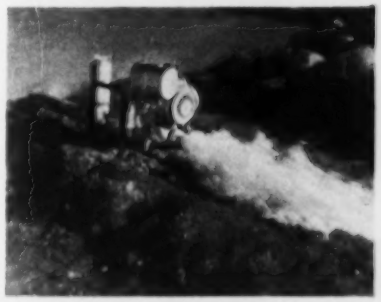
Despite its small size—it occupies only a square foot of floor space—it has unusually high cooling capacity, according to company reports. The unit cools as many as 2.9 gal of water at 90 deg temperature, enough to meet hourly demands of approximately 50 men.

The refrigeration system for the new cooler is completely sealed against dirt and is fully covered by a five-year warranty.

Provisions for cup and salt-tablet dispensers are provided, and a standard bottle from 1 to 5 gal can be used with the cooler. Cordley & Hayes, 443 Fourth Ave., New York 16, N. Y.

(New Products continued on page 72)

Full Line of Carryable Construction Equipment Now Offered by Homelite



Carryable Diaphragm Pump . . . This self-priming, 120 pound diaphragm pump will handle water in the thickest sand, muck, or mud. Capacity: 5,000 g.p.h. Size: 3". Complete line of centrifugal pumps are also available in sizes from 1½" to 3".

Chain Saws For Every Job . . . Now you can choose from a full line of lightweight, powerful Homelite chain saws. From 3½ to 7 horsepower . . . 19 to 29 pounds. Brush cutting and clearing attachments are available to handle all your cutting jobs.

One-Man Electric Vibrator . . . It takes only one man to place concrete with powerful, Homelite high-cycle or universal electric concrete vibrators. Carryable Homelite generator provides power for high-cycle vibrators *and* 110 volt DC for all universal vibrators, tools and floodlights.

HOMELITE

a division of Textron Inc.

PORT CHESTER, NEW YORK

makes hand lettering old fashioned

Its speed and uniformity is standard in modern drafting rooms—Legible reproduction of lettering is a must. But perfect hand lettering takes time and skill, and both cost big money these days. That's why thousands of modern drafting rooms have adopted Leroy® lettering—a K&E development—as standard on all jobs.

Leroy lettering can't help but be perfect regardless of the job or the experience of the man. Each letter is completely and uniformly produced in one quick, simple operation. It's so exact, yet so simple, that one man can start the job and another finish it without any variation in lettering. Because the lettering template is the same, there's almost no room for mistakes.

Every necessary type face and symbol in a wide range of sizes, is available in Leroy templates. Each template is engraved with traditional K&E attention to quality, built for a lifetime of use. Special electronic, mathematical, mapping and geological templates are available . . . we'll even make them to order with your own symbols or trademarks. See Leroy lettering equipment at your K&E dealer.

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89 YEARS OF LEADERSHIP In equipment and materials for drafting, surveying, reproduction and optical tooling . . . in slide rules and measuring tapes.

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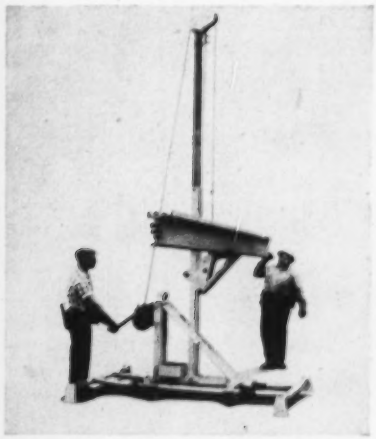


Boom and Outriggers Retract On Portable Erection Pole

An erection pole called Blue Ox rolls from job to job on a caster base 36x54 in. and then operates from outriggers that extend the base size to 56x85 in. For truck-bed mounting, the base can be bolted down.

Designed for loading and unloading, erecting building materials, or handling machinery, the unit has a 2-speed 1-ton hand winch and 60 ft of ⅜-in. steel cable that can be used in single, double or triple-stand hoisting.

The pole, comprising three telescoping steel tubes, is adjustable in 4-in. height increments from 9 ft to 20 ft. An auxiliary table, supplied with the unit, converts it to an elevator. Broad Crane & Engineering Service Co., 779 S. Dumfries, Detroit 17, Mich.

Foamed Plastic Insulation Can Be Laid Below Concrete

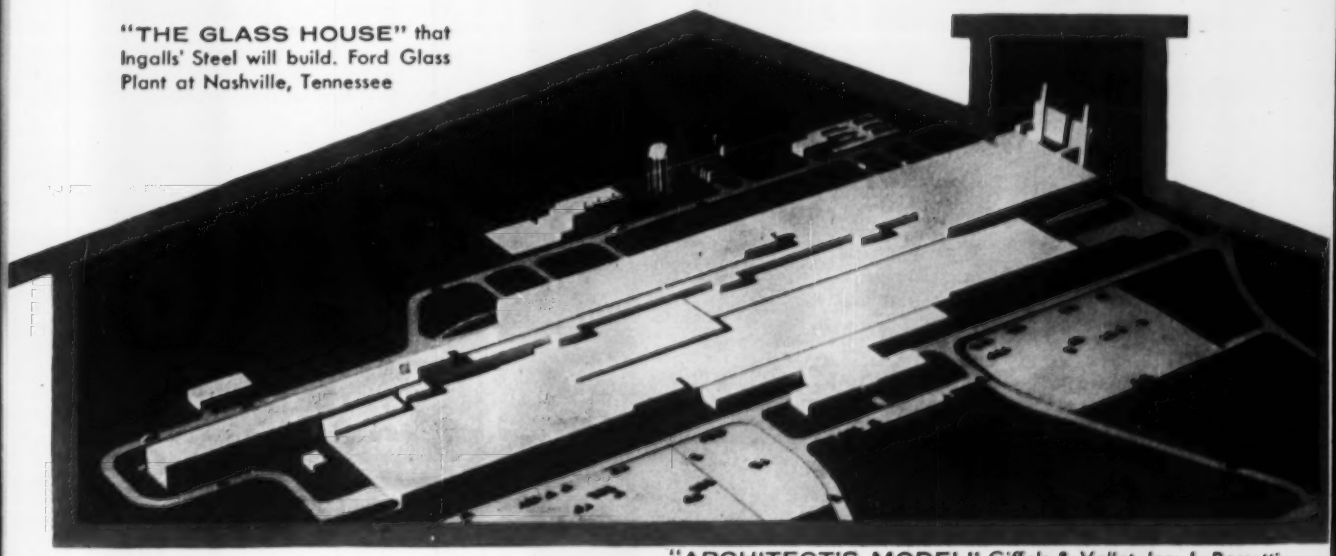
Armstrong Cork announces a foamed plastic insulating material called Armalite. The product is a rigid board designed for refrigeration equipment, cold rooms and refrigerated truck bodies.

Armalite's makers claim that it is strong enough to be installed under concrete wearing surfaces or as free-standing walls. Listed properties include: heat transmission factor k at 60 F mean temperature, 0.24 Btu-in. per hr-deg F-sq ft; weight, 1.25 lb per cu ft; average modulus of rupture, 24 psi. It can be used at temperatures from minus 50 F to plus 160 F.

Described as slightly resilient, the springy edges of the sheets can be butted under enough pressure to make tight joints. Standard sheets are 2, 3 and 4 in. thick—1x3 ft and 3x3 ft in area. Armstrong Cork Co., Lancaster, Pa.

PEOPLE WHO WORK IN GLASS HOUSES

"THE GLASS HOUSE" that Ingalls' Steel will build. Ford Glass Plant at Nashville, Tennessee



"ARCHITECT'S MODEL" Giffels & Vallet, Inc., L. Rossetti

. . . KNOW THAT LONG-TERM STRENGTH AND FLEXIBILITY MEAN INGALLS STEEL

FORD MOTOR CO.
GLASS PLANT
under construction; 8800 tons of steel needed for 1,101,900 sq. ft. of plant area.

PEOPLE WHO BUY STEEL know that to meet *all* the exacting schedules of modern construction, only the most efficient service backed with precisely the right steel requirements *means a job well done!*

Fabricating Steel is Our Business

Plants, warehouses and commercial buildings across the country are standing proof that INGALLS can meet *any* fabricated steel requirement. Plants at Verona, Pa.; (Pittsburgh District) North Birmingham, Ala.; Decatur, Ala.; Pascagoula, Miss. and Birmingham, Ala. *assure you* of service that's prompt, efficient and economical.

FABRICATED STEEL
For: POWER PLANTS • HANGARS
GRANDSTANDS • BRIDGES
CHURCHES • OFFICE BUILDINGS
STORES • APARTMENTS • THEATERS
TANKS • HOTELS • HOSPITALS
SCHOOLS • INDUSTRIAL BUILDINGS
BINS • PRESSURE VESSELS • STACKS

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LOW-COST
SONOTUBES®
form obround columns
for parking garage!

Parking Garage, Cincinnati, Ohio
Hake & Hake, arch.-engineer,
Cin.; Ferro Concrete Const. Co.,
contractor, Cin.

SONOTUBE®
FIBRE FORMS
for round columns of concrete

Forming obround, half round and quarter round columns with SONOTUBE Fibre Forms is economical and relatively simple. The inset photo, taken on the job during the construction of a parking garage in Cincinnati, Ohio, shows the form for an obround column using a template to hold the SONOTUBE halves in place.

Low-cost SONOTUBE Fibre Forms save time, money and labor! SONOTUBES provide a fast, economical method of forming round concrete columns to meet the design specifications of a wide variety of structures. Can be sawed on the job or ordered in required lengths. Available from 2" to 48" I.D. up to 48' long. Order Sonoco's patented "A-Coated" SONOTUBES for finished columns; wax-coated also available.

For complete technical data and prices, write

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AKRON, IND. • LONGVIEW, TEXAS • BRANTFORD, ONT. • MEXICO, D. F.

Publications

Lubricating equipment—Catalog 701 describes portable field lubricating equipment for contractors. It details the Graco Convoy Luber equipment available as complete ready-to-operate units; and job-planned field lubricators that the contractor can assemble to fit the job. A complete selection of lubrication accessories is included. Detailed typical diagrams, with complete bill of materials, are illustrated to aid the user in step-by-step planning of his field lubricator. GRAY CO., INC., 1062 SIBLEY ST. N.E., MINNEAPOLIS 13, MINN.

Fluorescent lighting—Bulletin B, a 36 pager, contains descriptions, illustrations and lighting data on 394 Benjamin industrial fluorescent lighting units. Lighting systems for factory work areas, general lighting, critical seeing tasks, humid areas and hazardous locations where explosive dust may be in the air, are among the units listed. An easy-to-follow arrangement speeds and simplifies reference according to reflector types, lamp types, accessories, construction and lighting data. A separate section contains a tabulation of coefficients of utilization for 22 of the units. BENJAMIN ELECTRIC MFG. CO., DES PLAINES, ILL.

Steel-framed shopping centers—Of interest to anyone concerned with the construction of shopping centers, the 16-page "Shopping Centers Framed with Steel" discusses advantages of steel construction in this field. Illustrated with photographs and engineering drawings, a special feature is a fold-out chart that gives vital statistics on 41 shopping centers framed in steel. Chart is broken down into regional, district and neighborhood centers. AMERICAN INSTITUTE OF STEEL CONSTRUCTION, INC., 101 PARK AVE., NEW YORK 17, N. Y.

Lead construction—Four-page Bulletin No. 2 provides easy-to-use specifications for lead shower and safe pans; moisture proofing for soda fountains, plating rooms, pipe shafts and other spillage or leakage places is also included. Detailed drawings illustrate recommended methods of installation. ARCHITECTURAL DEPT., LEAD INDUSTRIES ASSN., 60 E. 42 ST., NEW YORK 17, N. Y.

Sewer construction—An illustrated 4-page booklet "Good Practice in Sewer Construction" gives complete data on proper techniques for finishing, backfilling, inspection, and trench preparation for laying clay sewer pipe. CLAY PIPE SEWER ASSN., 311 HIGH-LONG BLDG., 5 EAST LONG ST., COLUMBUS, OHIO.

Men and Jobs

Terzaghi Appointed Lecturer In Soil Mechanics at MIT

Karl Terzaghi, called the founder of the modern science of soil mechanics, has been appointed lecturer and research consultant in that field for the current academic year at Massachusetts Institute of Technology.

Civil engineering professor emeritus of Harvard, Terzaghi had previously taught at MIT in the early 1920's, at which time he developed the first courses in soil mechanics in the U. S.

He is president of the International Conference on Soil Mechanics and Foundation Engineering. Among his numerous awards is ASCE's Norman Medal.

Engineer Chosen to Head New Alaska Division

Morton M. Flint has been transferred by the Bureau of Public Roads from Sacramento, Calif., to Juneau, Alaska, where he will serve as division engineer of a newly created division.

Flint will direct the federal road program in Alaska under the new U. S. highway law, which merged the Alaska Road Commission into the bureau. He had served as construction engineer and assistant chief engineer in the Juneau office—when it held district status—until he became district engineer at Missoula, Mont., two years ago.

Planning Director Picked For City of Winston-Salem

Terminating five years of service with the New Orleans City Planning Commission, John Benjamin Rouzie, Jr., has been named planning director for Forsyth County, N. C., and the City of Winston-Salem, its county seat.

Rouzie was a member of the New Orleans City Planning Commission from November, 1951, and has been chief planner there since April, 1953.

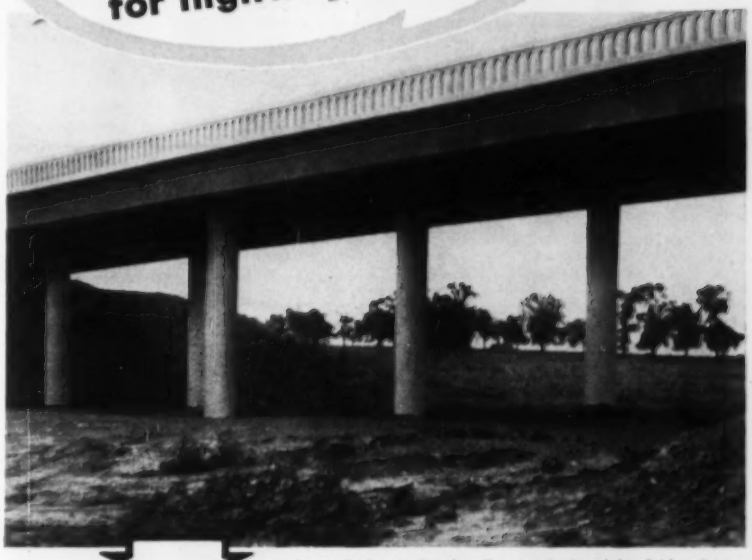
Connell Is Vice President For Stone & Webster Corp.

Arthur J. Connell has been elected a vice president of Stone & Webster Engineering Corp., according to an announcement by T. C. Williams, president of the firm.

Connell, active in petroleum and chemical projects since his graduation from Massachusetts Institute of Technology in 1927, joined the corporation in 1951.

As a vice president and consulting engineer, he will continue to serve the

LOW-COST SONOTUBES® form support columns for highway bridges!



Highway Bridge in Topeka, Kansas. Designed by Bridge Dept., Kansas State Hwy. Comm. J. W. Frisbee, Kansas City, Mo., contractor

SONOTUBE®

FIBRE FORMS

for round columns of concrete

The supporting round concrete columns for the bridge structures built on the relocation of U. S. Hwys. 40 and 24, west of Topeka, Kansas, were formed by low-cost SONOTUBES. The bridge decks contain hollows formed by low-cost SONOVOIDS.

Columns like these cost less to construct because SONOTUBE Fibre Forms need only minimum bracing, take less time to erect and require fewer men for the job. These low-cost, lightweight, easily handled fibre forms can be sawed to size at the site or ordered in specified lengths.

Save time, money and labor . . . use SONOTUBES on your next job! Sizes from 2" to 48" I.D. up to 48' long. Order Sonoco's patented "A-Coated" SONOTUBES for finished columns; wax-coated also available.

For complete technical data and prices, write

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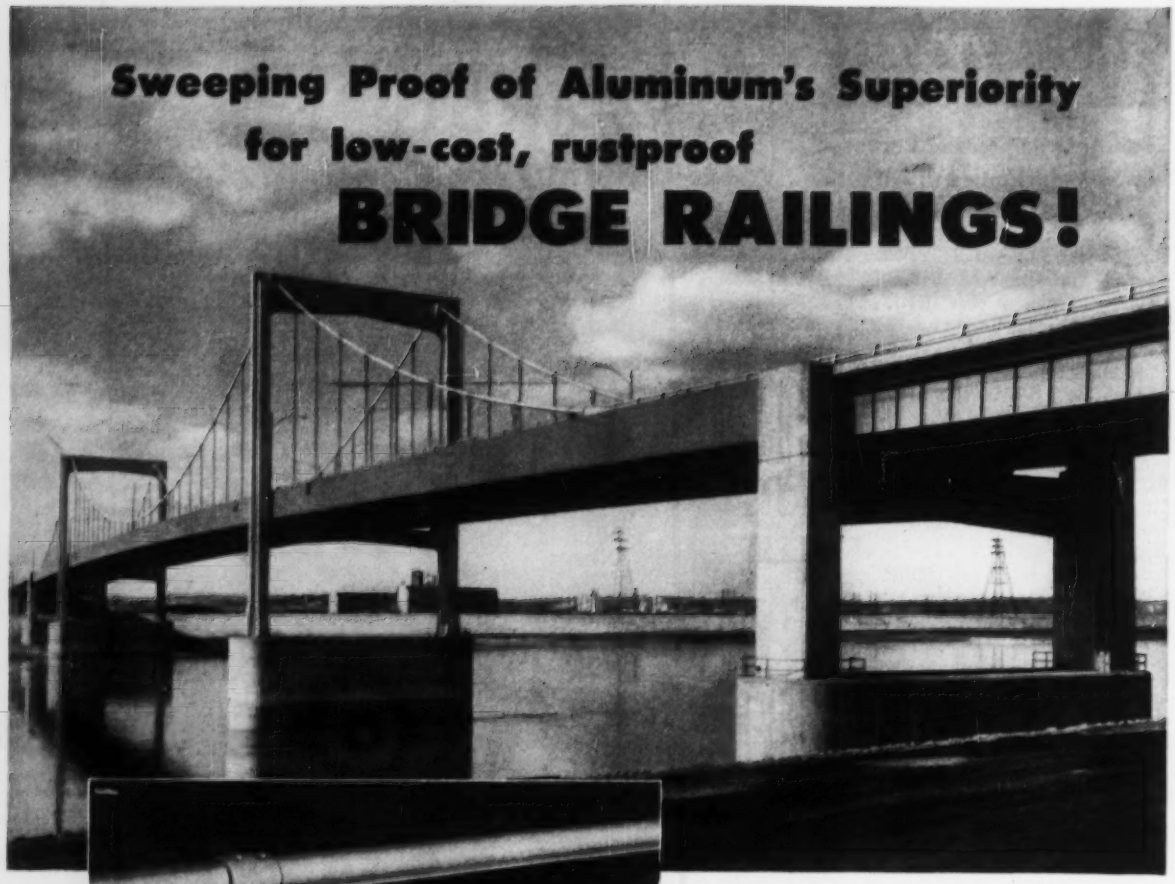
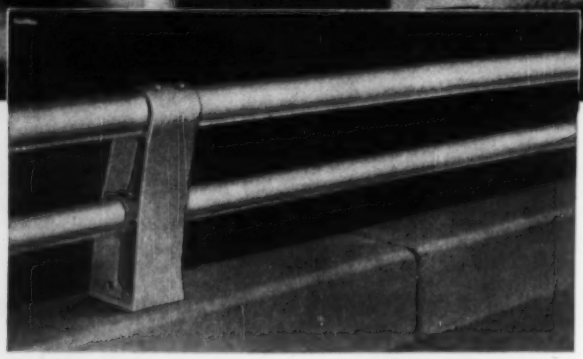
Sweeping Proof of Aluminum's Superiority for low-cost, rustproof BRIDGE RAILINGS!





Reynolds Aluminum Guard Rails on Paseo Trafficway between North Kansas City and Kansas City, Missouri.

Engineers:
Howard, Needles, Tammen and Bergendoff, Kansas City.

Bridge Superstructure and Erection of Railings:
American Bridge Company.

Fabricators:
Southwest Ornamental Iron Company, Kansas City.

Reynolds Aluminum adds its advantages of maintenance-free beauty and low cost to still another modern bridge design. These double rails of rustproof Reynolds Aluminum pipe are anchored to cast aluminum posts for an installation of exceptional durability.

Once again a standard Reynolds Aluminum mill product—extruded pipe—was specified for its ease of installation and all around functional superiority, its adaptability to a specific design need. For other requirements and for names of metal fabricators who can perform aluminum work to your specifications, call the nearest Reynolds Office listed under "Aluminum" in classified directories. Or write to **Reynolds Metals Company,** General Sales Office, Louisville 1, Kentucky.

For quick reference, see catalog $\frac{5a}{Re}$ in Sweet's Architectural File.

REYNOLDS ALUMINUM

See "CIRCUS BOY," Reynolds new dramatic adventure series, Sundays, NBC-TV Network.

firm in the petroleum chemical and petrochemical fields.

Engineer Takes Top Award For Arc Welding Progress

Herman Tachau of Santa Fe, N. M., an engineer with the state highway department, received the first award of $5,000 in a competition for ideas to accelerate the progress of arc welding. The competition is sponsored by the James F. Lincoln Arc Welding Foundation of Cleveland, Ohio. The award was one of 20, totaling $20,000, made to men in 16 different states.

The second award of $4,000 went to Van Rensselaer P. Saxe, a consulting engineer of Baltimore, Md.; T. C. Kavanagh, a consulting engineer of New York City received the $3,000 third award; Bruce G. Johnston, a professor of structural engineering at the University of Michigan received $2,000; and Orville T. Barnett and John Rudy, both of the Armour Research Foundation of Chicago shared the $1,000 fifth award.

Men and Jobs Briefs . . .

• **Associations**—The Prestressed Concrete Institute names **Martin P. Korn** as executive secretary with headquarters in Boca Raton, Fla. . . . **A. J. Frank** of New York is elected president of U.S.A. Section of the Inter-American Association of Sanitary Engineering.

• **Careers**—The director of the Shenango Valley Regional Planning Commission in Sharon, Pa., **Robert J. Bartels** will take over as Hartford, Conn.'s first executive director of the City Plan Commission on Dec. 10. From 1951 to 1952 he was planning technician for Poughkeepsie, N. Y. Area Development Association.

• **Business**—A new consulting partnership of structural steel designers and detailers is formed by **Edward K. Metcalfe** and **Nathan N. Solochek**. The firm, Metcalfe-Solochek & Co. has its headquarters in Chicago, Ill. . . . **Eugene Tannen** is named associate in charge of the New York office of Victor Gruen & Associates a national architectural firm. Tannen joined the Gruen organization in November 1952; prior to this he was manager of the commercial division of Kelly & Gruzen, architects and engineers.

Atlas Powder realigns its central engineering department into three sections and appoints a new employee to head one of the sections. The department now is composed of a construction services section headed by **Frank Irwin**; an industrial services section with **Frank C. Gromann** as manager and a design section headed by **Wilbur H. Kordt**, who recently joined the Atlas staff . . . **E. G. Kominek** and **A. A. Kalinske** are elected as vice presidents of Infilico, Inc., makers of water and waste treatment equipment in Los Angeles, Calif.

• **Honors**—**W. Howard Corddry**, vice vice president and chief engineer of Gannett Fleming Corddry and Carpenter, Inc., Harrisburg, Pa., was recently awarded an alumni citation at Washington College. Corddry worked on the study of the water resources of the Delaware River Basin which New York would tap as a source of water supply.

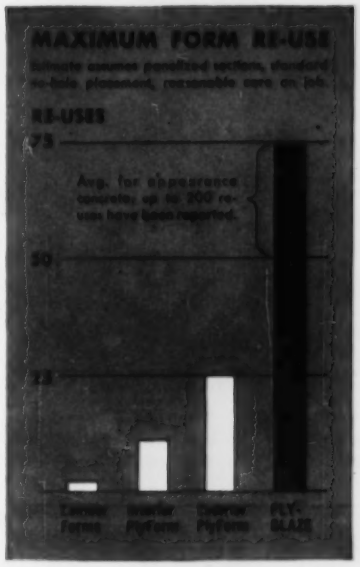
• **Retirements**—**A. H. Kenigsberg**, of the Nashville District, Corps of Engineers, after 20 years as design engineer, to open a consulting office in civil and structural engineering in Nashville, Tenn. Prior to his Corps of Engineers service he had been a design engineer for the consulting firms of Sargent & Lundy and L. F. Harze Engineering Co., both of Chicago.

Obituaries

George N. Schoonmaker, 68, former Toledo, Ohio, city manager and Lucas County commissioner, died Oct. 22. Nearly fifty years in public service, he had a major role in planning Toledo's $10-million Lake Erie water supply. He was first employed by the city of Toledo in 1906. He served as water commissioner from 1920 to 1922 and later was assistant water commissioner for four years. He left public service temporarily to take the job as sanitary engineer with H. P. Jones Co., of Toledo. In 1930 he was appointed city commissioner of engineering. Later, in 1937, he became chief engineer of the waterworks division until 1939 when he was named city manager of Toledo, a post he held for 10 years.

George John Beck, 65, a civil engineer in Seattle Wash., died Oct. 17. He had been an engineer with the state highway department for 30 years, most recently as assistant district highway engineer at Seattle. Prior to that he served as resident state highway engineer at Yakima and district maintenance engineer at Spokane. He was a graduate of the University of Idaho School of engineering.

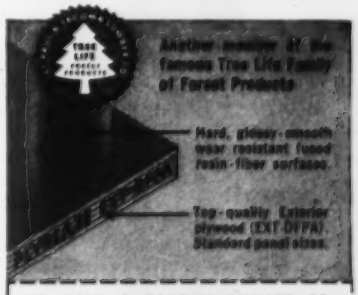
Henry Gallenstein, Sr., 73, one of the founders and organizers of five business concerns in the construction field in southern Ohio, died Oct. 8.



50 to 75 is a good average, but with care you can get up to . . .

200 RE-USES with PLYGLAZE CONCRETE FORM PANELS

PLYGLAZE's tough, hard surface stands up indefinitely under repeated concrete pourings. PlyGlaze forms are worn out only when the panels are cut into unserviceably small pieces. With proper design and care you should get 50 to 75 re-uses. Actually, *over* 200 have been obtained—even then PlyGlaze continues to form good-looking concrete.


Another member of the famous Tree Life Family of Forest Products
Hard, glossy-smooth wear resistant fused resin-fiber surface.
Top-quality Exterior plywood (EXT-DFPA). Standard panel sizes.

ST. PAUL & TACOMA LUMBER CO.
Dept. INR, Tacoma 2, Wash.
Please send free PlyGlaze literature.

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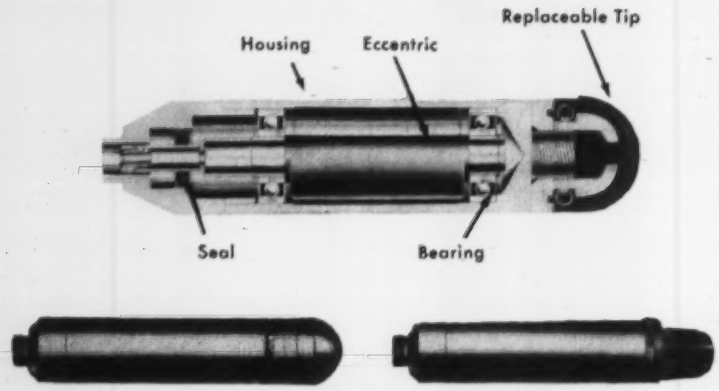


SIMPLE DESIGN – Short head Viber vibrators are simple in design and have few parts as indicated in cut-away picture above. Head assembly with replaceable rubber tip is shown at left. Assembly with 3-finned steel-cast tip at right.

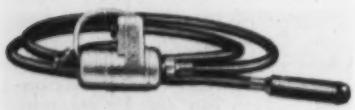
Short Head Viber Vibrators Offer Major Advantages in Placement of Concrete

VIBER VIBRATOR heads are short, easy to manipulate – simple, easy to maintain. Simple construction of the Viber head makes a compact assembly which maneuvers easily around steel and into awkward, hard-to-reach places.

The Viber design utilizes a single eccentric weight in a heat-treated alloy steel housing. Other parts are one bearing at each end of the weight and a grease seal. Viber patented replaceable rubber tip is standard equipment, with 3-finned steel cast tip optional.

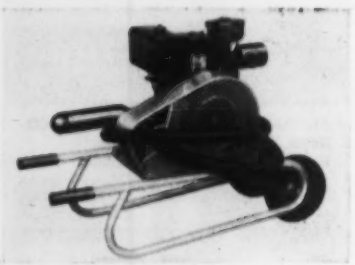
Viber heads are light weight, ranging from 6 to 16 pounds . . . 11 to 12 inches in length and are available in four diameters – 1¾ in., 2⅛ in., 2½ in. and 3 in.

Flexible shaft driven, Viber vibrators are powered by electricity, gasoline or air . . . easily adapted to varying job conditions. They are high speed, operating at speeds between 8500 and 11,000 rpm.



Model E Electric

Model P Pneumatic



Model G Gasoline

Viber Replaceable Rubber Tips

Viber rubber tips save contractors thousands of dollars yearly by preventing damage to forms of plywood and other expensive materials. In addition, since most wear on a vibrator occurs on the end of the housing, use of replaceable rubber tips greatly extends housing life.

Viber vibrators are effective. More work can be done in less time and with minimum danger of damage to forms by using the high speed low amplitude type of vibrator pioneered by VIBER.

For complete information on Viber vibrators and address of nearest distributor, write Viber Company, 726 South Flower St., Burbank, Calif. Dept. 7E11.

VIBER

VIBRATORS SINCE 1931

Legal

A Contract May Not Exist Until Future Event Occurs

"Where parties to a writing which purports to be an integration of a contract between them orally agree, before or contemporaneously with the making of the writing, that it shall not become binding until a future day or until the happening of a future event, the oral agreement is operative if there is nothing in the writing inconsistent therewith."[1] (quoting from Restatement, Contracts, Section 241; See, also, to same effect, 3 Williston, Contracts, Section 634.

In a case where the written contract provided that "no oral arrangements, waiver or modification of any of the terms of the contract shall be binding upon us unless confirmed in writing", the New York Court of Appeals held that it was improper for the trial court to admit testimony to show that the contract was not to become effective until the happening of some future event. "We believe that this (the admission of such testimony) would considerably impair the effectiveness of the parol evidence rule, which, like other rules of law, is occasionally unjust, but is nevertheless wise and beneficial in its general operation."[2] The ruling of the court was predicated on the fact that the admission of such testimony was inconsistent with the terms of the written contract.

(1) Burrowes Corp. v. Read, 116 A. 2d 127, Supreme Judicial Court of Maine, July, 1955. (2) Fadex Foreign Trading Corp. v. Crown Steel Corp., 272 App. Div. 273, 70 N.Y.S. 2d 892, Affirmed, 297 N.Y. 903, 79 N.E. 2d 739.

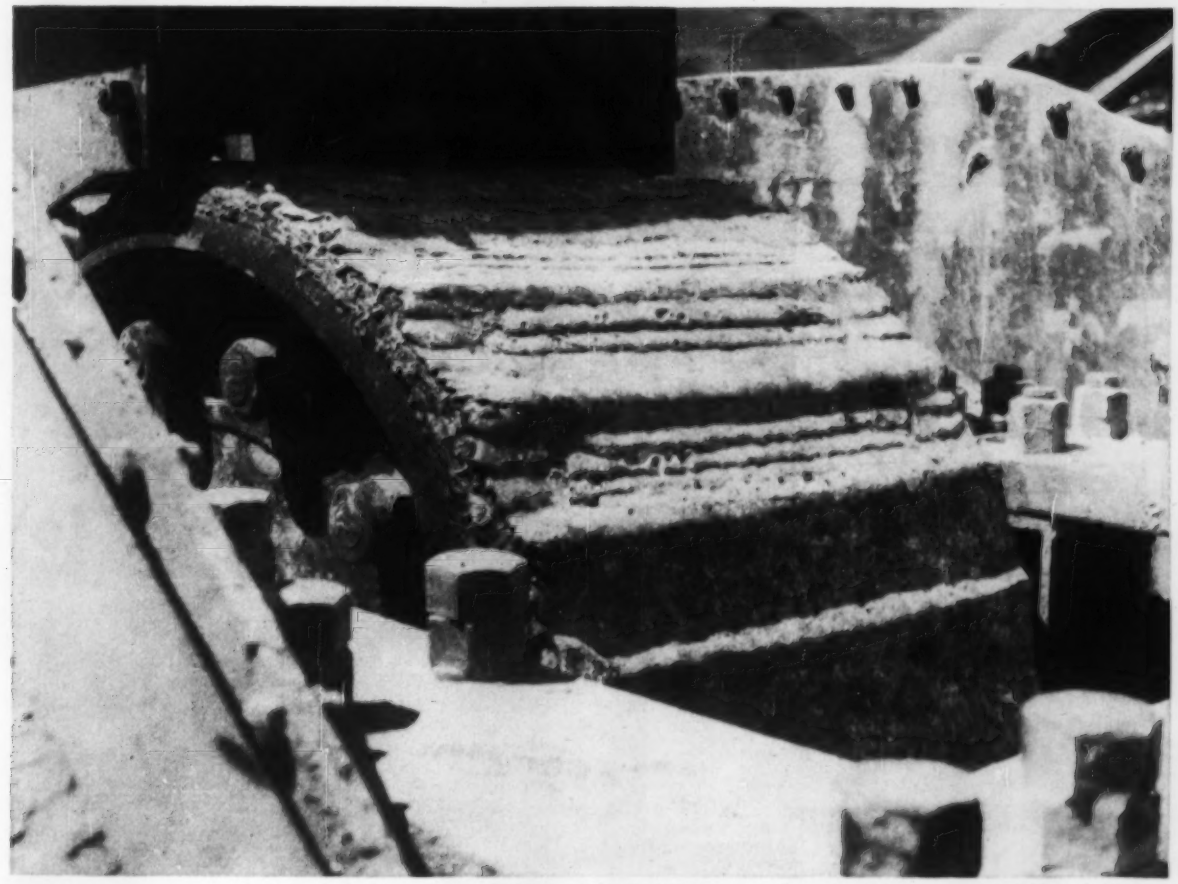
Liability for Damages Resulting From Blasting

Negligence is the basis of a contractor's liability for damages caused by blasting. If negligence is shown, the injured party can usually recover even if it's difficult to assess the damage.

An action was brought in Massachusetts, for example, by an owner who claimed his building was damaged by blasting. Many blasts were made but only one was shown to have been done in a negligent manner. The evidence produced by the owner showed that it would cost $1,400 to repair all the damage caused by blasting. The jury brought in a verdict in the amount of $1,000 in favor of the property owner.

The contractor, during the trial, made an application to the court to dismiss the action on the ground that there was no proof to show how much

(*Legal continued on page 83*)



Since their last major rebuilding, this 18" x 30" Pioneer roll crusher has produced 30,000 tons of aggregate. Twice-a-week touch-ups with Stoody 100 hold wear to a minimum.

STOODY SEMI-AUTOMATIC HARD-FACING helps maintain road schedule in HIGH SIERRAS

A new 16½ mile State Highway between Shaver Lake and Huntington Lake in the high Sierras was recently completed by Phoenix Construction Co. of Bakersfield, California. One interesting feature of the job was the preparation of aggregate which was supplied by portable crushers operating near the site. Material used was quarried blue granite. Primary reduction was effected by jaw crushers followed by a final roll crushing operation. 210,000 tons of aggregate were required, as well as production of sand from the same material. Crusher rolls consequently suffered considerable wear.

The crusher corrugations were completely rebuilt with Stoody Manganese, spacing about 3" peak-to-peak. These were overlaid with Stoody 100 applied with the semi-automatic welder. Wear was never permitted to reach the manganese shell thereafter. During shut-downs, corrugations were retouched with Stoody 100, as required, restoring full efficiency for the following shifts.

Facilitating maintenance work is this portable semi-automatic welding machine. Quickly hauled to the site, it is dismounted from the truck for use.

Hard-facing methods for most successfully maintaining all your wearing equipment are fully described in the Stoody Guidebook and folder covering semi-automatic procedures. Ask your Stoody dealer for a copy (see the "Yellow Pages" of your phone book) or write direct.

STOODY COMPANY
11976 East Slauson Avenue
Whittier, California

Is your tractor fleet ready for next year's roadbuilding?

You can't very well wait for the contract awards to plan your equipment spreads for next year's jobs. We both know that "time is of the essence" . . . deliveries, now slow, will be even slower. We, at LeTourneau-Westinghouse, have been expanding our production facilities as fast as we can build and equip. Our orders tell us that many customers are already modernizing for the future with our equipment.

Isn't it time for you, too, to take a look at your equipment inventory?

Since the first units on the job are your tractors, perhaps that is a good place to start. Especially so, since study of the four dimensions of modern earthmoving . . . 1 . . . Power . . . 2 . . . Traction . . . 3 . . . Speed . . . and . . . 4 . . . Mobility . . . show that you have maximum opportunity to increase production and make cost savings by modernizing your traction fleet.

Why not have a list of your tractors made to show, by machine . . . age . . . book value . . . trade value . . . power . . . weight . . . speeds . . . type tranmission . . . torque converter . . . range of economical self-powered moves? From this list you can plan a program of replacement and additions to improve your bidding position, your completion schedules, and your profit margins.

In making up your list of needed new equipment, study your recent big job experience to arrive at the desirable percentage for tractors on tracks with their advantage in low speed lugging, and the percentage for tractors on rubber with their big advantage in speed and mobility. Set up these rubber and track percentages separately for your pioneering, your fill, your pushing, and your finishing crew.

We believe that, at present, Tournatractor is the only job-proved candidate for your consideration in heavy duty rubber-tired tractors. You have, no doubt, heard that competitive tractor manufacturers are designing and testing new, big, rubber-tired tractors. Some are conversions of crawler tractors with wheels instead of tracks. Some are new designs based on experience with small rubber-tired farm tractors. But only Tournatractor has 10 years of heavy duty field experience behind it and a long list of improvements based on this experience that make it a fully dependable, high-speed tractor ready for present-day earthmoving.

And, incidentally, when you hear stories of field troubles on Tournatractor operation, be sure you check for specific dates of the model and date of the trouble. Yes, we have had our troubles with Tournatractor . . . but, with an active program of continuous improvement, our reports on present-day machines show that we now have a good serviceable tractor that can give operating efficiency and maintenance economy equal, or better, than that of your present day crawler tractors.

How Federal Highway Spending Will Step Up

The following table from *Business Week* shows increase, by states, in Federal Aid over next three years. Note that the increase to 90% in Federal participation on Interstate System Roads, will mean availability of additional state funds for use on the state and local highway system.

(Fiscal Years, Millions of Dollars)

STATE	1956	1957	1958	1959
Alabama	17.8	40.5	51.5	58.1
Arizona	10.6	23.6	29.7	33.4
Arkansas	12.9	29.3	37.3	42.1
California	47.1	110.9	142.6	161.2
Colorado	13.2	28.9	36.6	41.1
Connecticut	8.0	18.9	24.3	27.5
Delaware	4.0	10.9	14.2	16.3
Florida	14.5	33.6	42.9	48.4
Georgia	20.3	46.4	59.2	66.8
Idaho	8.7	20.1	25.5	28.8
Illinois	39.0	91.7	118.2	133.3
Indiana	21.0	48.2	61.7	69.6
Iowa	18.9	42.0	53.0	59.7
Kansas	17.8	38.4	48.2	54.2
Kentucky	15.7	36.7	47.1	53.2
Louisiana	13.8	32.3	41.6	46.9
Maine	6.7	15.5	20.1	22.6
Maryland	9.5	22.7	29.6	33.5
Massachusetts	16.3	39.9	52.1	59.0
Michigan	30.0	70.5	90.4	101.9
Minnesota	20.7	46.4	58.5	65.9
Mississippi	14.0	31.9	40.5	45.6
Missouri	24.4	55.0	69.7	78.5
Montana	13.5	29.9	37.9	42.6
Nebraska	14.0	30.3	38.5	43.3
Nevada	8.7	20.3	26.0	29.4
New Hampshire	4.2	11.0	14.4	16.5
New Jersey	16.8	41.2	53.4	60.4
New Mexico	11.3	25.0	31.6	35.5
New York	56.1	135.1	174.7	197.7
North Carolina	21.1	49.7	63.8	72.0
North Dakota	10.1	22.8	28.5	32.2
Ohio	35.1	82.9	106.9	120.5
Oklahoma	16.6	36.8	46.6	52.5
Oregon	12.9	28.3	35.7	40.2
Pennsylvania	42.0	101.7	132.2	149.4
Rhode Island	4.9	11.9	15.3	17.4
South Carolina	11.3	16.3	33.7	38.0
South Dakota	10.8	24.0	29.9	33.7
Tennessee	18.4	42.3	54.3	61.2
Texas	52.4	117.5	149.0	167.8
Utah	8.4	19.2	24.7	27.9
Vermont	3.9	10.7	14.1	16.1
Virginia	16.8	39.4	50.8	57.4
Washington	14.1	32.1	41.1	46.3
West Virginia	9.6	22.8	29.6	33.3
Wisconsin	20.0	45.6	58.2	65.4
Wyoming	8.5	20.1	25.9	29.3
Hawaii	3.2	3.7	3.9	4.0
District of Columbia	5.1	12.2	15.7	17.7
Puerto Rico	4.8	5.7	5.9	6.2
Alaska	0	1.9	13.2	13.5

Check, too, present prices of crawlers vs Tournatractor and note approximately 10% saving for Tournatractor compared with crawler tractors having similar engine horsepower and with torque converters.

Plan for delivery of at least one of these rubber-tired units in time for fall operation on present jobs. This will give you some experience in planning operation and training your operators to get the most out of these high-speed units for maximum profit on next year's jobs. This addition to your fleet will also speed up your clean-up on fall and winter work on present contracts so as to clear the deck for early starts on new contracts next spring. After you have had the opportunity to use one of these rubber-tired tractors on your job, we are sure you will want more for the extensive highway program ahead.

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of the damage was caused by the one blast that was considered negligent, contending that the amount of damage could only be based on conjecture and surmise. The court denied the application and sustained the judgment in favor of the property owner.[1]

The court made the following observations: "In the absence of negligence a person carrying on blasting operations is not liable for consequential harm caused by concussion and vibration. Jenkins v. A. G. Tomaselle & Son, Inc., 286 Mass. 180, 186, 189 N.E. 817; Coughlan v. Grande & Son, Inc., 332 Mass. 464,467, 125 N. E. 2d 778."

"It is true of course that damages must be reasonably ascertainable from the evidence. Gagnon v. Sperry & Hutchinson Co., 206 Mass. 547, 556, 92 N.E. 761; Burnham v. Dowd, 217 Mass. 351, 360, 104 N.E. 841, 51 L.R.A., N.S., 778; Birch v. Boston & Maine Railroad, 259 Mass. 528, 531, 156 N.E. 859. But the fact that there is an element of uncertainty in their assessment is not a bar to recovery. H. D. Watts Co. v. American Bond & Mortgage Co., 267 Mass. 541, 553-554, 166 N.E. 713, 84 A.L.R. 12. The amount of damages seldom can be proved with the exactness of mathematical demonstration. Much must be left to estimate and judgment, sometimes upon meager evidence. Piper v. Childs, 290 Mass. 560, 563, 195 N.E. 763; Cross v. Sharaffa, 281 Mass. 329, 183 N.E. 838; New York, New Haven & Hartford Railroad Co. v. Pierce Coach Lines, Inc., 281 Mass. 479, 483, 183 N. E. 836."

(1) Dalton v. Demos Brothers General Contractors, 135 N.E. 2d 646, Supreme Judicial Court of Mass., June 29, 1956.

Law Gives a Supplier Time To Furnish Extra Materials

When a contract for the furnishing of a specified quantity of construction materials provides that additional materials will be provided, if necessary to complete the job, reasonable notice of the need of the extra materials must be given.

In the following case, reasonable notice was not given and the court ruled that failure to make immediate delivery was therefore not a breach of contract. Here are the facts:

From the spring of 1951 until the fall of 1952, Charles Hulme was engaged in carrying out a railroad construction contract in South Dakota entered into with the Corps of Engineers. During the same period, Sweetman Construction Co. was engaged in carrying out a similar contract. In order to fulfill his contract, Hulme required a quantity of crushed rock materials, consisting of surface gravel, sub-ballast and ballast. On October 31, 1951, Hulme and Sweetman entered a written contract, which provided that Sweetman would stockpile for Hulme, at a designated location, approximately 1,570 cubic yards of surface gravel, approximately 2,280 cubic yards of sub-ballast, and approximately 5,000 cubic yards of ballast, all in accordance with specifications for such materials set forth in the contract between Hulme and the Corps of Engineers. Hulme agreed to pay Sweetman the sum of $1.75 per cubic yard, 30 days after creation of the stockpile or withdrawal of materials. Sweetman further agreed that in the event additional materials should be necessary, it would stockpile them.

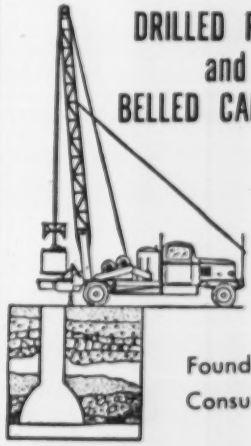
Sweetman completed the stockpiling of the amounts of materials specifically stipulated in the contract about January 1, 1952. It also stockpiled materials for its own use. From the middle of November, 1951, until January 5, 1952, Hulme withdrew approximately 5,895.6 cubic yards of materials.

The contract between Hulme and the Corps of Engineers provided that the work should be completed by April 25, 1952. Sweetman moved its crusher and other equipment to another project approximately 125 miles distant from the stockpile. Hulme continued to withdraw from the stockpile up to September 3, 1952, and by this time had withdrawn all of the original materials stockpiled for him in the amounts set out in his contract with Sweetman and in addition a small amount of materials that Sweetman had stockpiled for his own use. Thereupon, Sweetman refused to permit Hulme to withdraw further materials from the stockpile.

On several occasions between September 3 and September 15, 1952, Hulme made demand on Sweetman to stockpile immediately additional materials. Several times between September 3 and September 12, 1952, Sweetman notified Hulme that the additional materials would be furnished by one Rounds, who would move in his crushing equipment. Rounds delivered some of the necessary materials but these were rejected by the Corps of Engineers.

On September 24, 1952, Sweetman notified Hulme that it would return its equipment and would begin furnishing the additional materials on or about October 1, 1952. On September 15, 1952, Hulme made arrangements from one Lyle Hedrick for obtaining the additional materials and Hedrick commenced furnishing the additional materials shortly after September 29, 1952.

(*Legal continued on page 84*)



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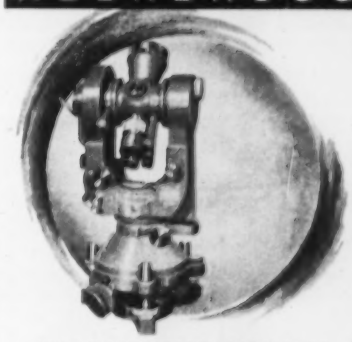

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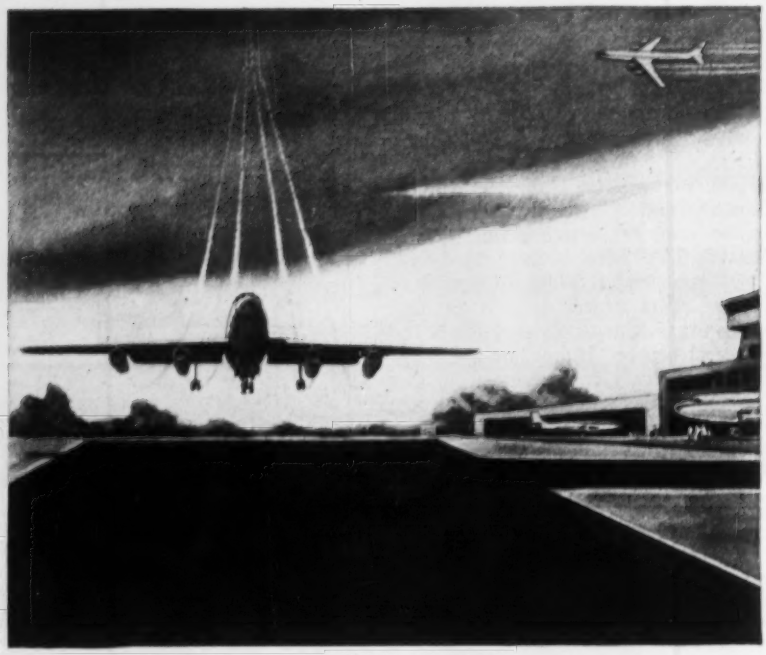

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Hulme completed his contract on October 5, 1952.

Sweetman brought an action to recover a balance he claimed was due for the materials furnished. Hulme interposed a counterclaim for the amounts paid Hedrick for the additional materials in excess of the contract price with Sweetman. The trial court rendered a judgment in favor of Sweetman, the court holding that the demand of Hulme that Sweetman immediately stockpile the additional materials was unreasonable and that Sweetman offered to stockpile the materials within a reasonable time after receiving notice to do so. This judgment was affirmed on appeal.[1]

The appellate court stated: "The requirement of Sweetman to furnish additional materials being dependent upon a future contingent event, of which he had no knowledge, it was incumbent upon Hulme to give him reasonable notice that he would require additional materials and to afford Sweetman a reasonable time, under the circumstances to furnish additional materials.

"Hulme must have known for some time prior to September 3, 1952, that he would need additional materials. He waited until he had removed all of the materials that had been stockpiled for him and some additional materials that Sweetman had stockpiled for itself before notifying Sweetman that additional materials would be needed to complete Hulme's contract with the Corps of Engineers. Sweetman was not required to keep rock crushing and other equipment standing by to meet a possible requirement of Hulme for additional materials.

"When Hulme demanded that Sweetman furnish additional materials immediately, Sweetman undertook to provide such materials through one Rounds. When Rounds' materials proved to be unsatisfactory, Sweetman offered, on September 24, 1952, to commence furnishing the additional materials on October 1, 1952.

"We think a furnishing of the additional materials by Sweetman, commencing October 1, 1952, would have constituted a reasonable compliance with Steelman's obligation under the contract. The failure of Hulme to accept that offer and the action of Hulme in securing the materials from another source excused Sweetman from further performance under the contract.

"We conclude that Sweetman did not breach the contract with Hulme and that the judgment should be affirmed."

(1) Hulme v. Sweetman Const. Co., 230 F. 2d 66, U.S. Court of Appeals, Feb. 1, 1956.

(*Legal continued on page 86*)

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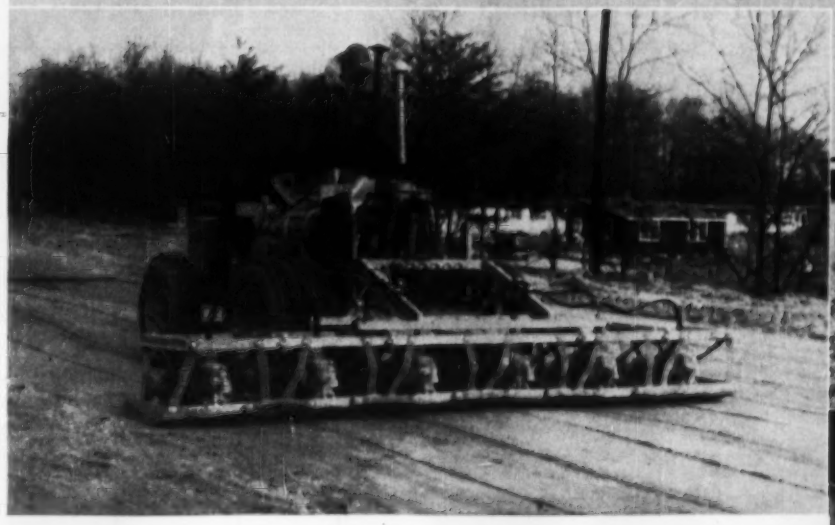

6 COMPACTING UNITS IN WORK-HEAD for maximum productivity in straight-away work. Left: Compacting sand fill in a bridge approach . . . another phase of its wide range utility to paving contractors.

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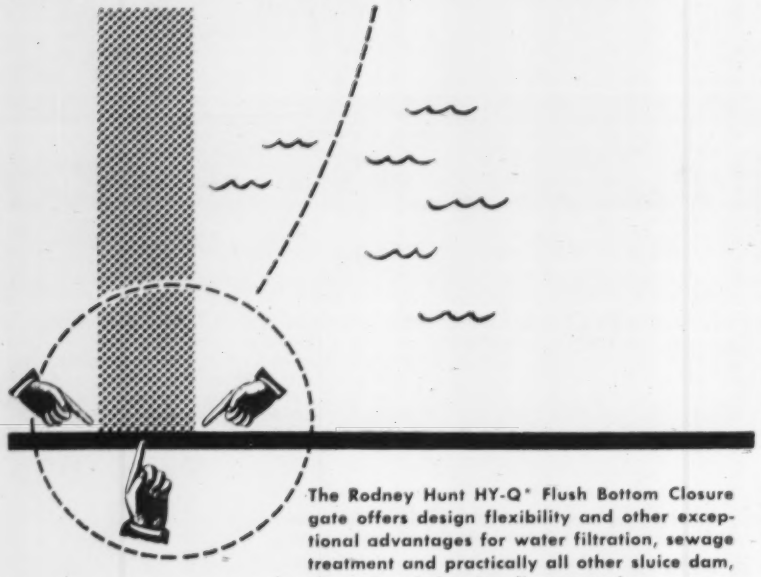

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. . . Legal

New Contract Can Be Made To Take Place of Old One

If an owner orders a contractor to stop work before the job is done and promises to pay for the work completed up to that point, a court may conclude that the old contract has been canceled and that a valid new contract has been made.

In the following case the court took that approach and allowed the contractor to recover for the work he had done although not enough work had been completed to entitle him to his first payment under the original contract.

A contract was entered into for the construction of a building. The contract provided that the first payment in the amount of 20% of the contract price would be paid to the contractor when the first joists had been put in place.

After obtaining an excavation permit, the contractor performed the necessary excavation work. The owner directed the contractor to proceed with the other work before a building permit had been obtained. As a result of such instructions, the contractor ordered certain materials and did preliminary work required for construction of the building. After this work had been performed, it was discovered that the type of soil on the lot was not suited for the septic tank called for by the plans and specifications. The owner then directed the contractor to stop all work and asked him to submit a bill for the work which he had already performed and for which the owner agreed to pay. The contractor submitted his bill and, upon the owner's refusal to pay, he sued to recover for the work performed up to the time the contractor was directed to stop work.

The owner claimed that the contractor was not entitled to recover because under the terms of the contract he was not to receive any payment until the first joists had been installed and that part of the work had not been performed. The owner also contended that since part of the work was done before any building permit had been issued for the work, the work done by the contractor was illegal and in violation of the law. The contractor contended, which contention was sustained by the court, that the original contract had been cancelled and a new agreement entered into whereby the owner agreed to pay the contractor for the work he had performed up to the time he was directed to stop work. The court granted the contractor

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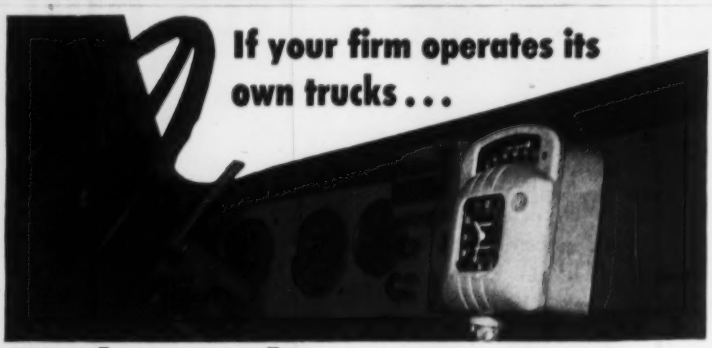

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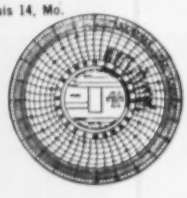

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a recovery, finding as a fact that the stoppage of the work did not result from any wrongful act on the part of the contractor.[1]

(1) Pinkham v. Salyer, 115 A. 2d 519.

Right to Rescind Contract Because of Mistake in Bid

Rescission of a contract in the case of a unilateral mistake in computing the bid is granted only in cases where the mistake is so gross that the other party can be charged with knowledge that the contractor had made a serious mistake.

An electrical contractor, for example, after entering a contract to install certain electrical equipment in an apartment house that was being erected brought an action to rescind the contract because of a mistake made in computing the bid. The application was denied on the ground that the evidence produced at the trial failed to show that the mistake was of such a character that the other party should have known that there had been a mistake.[1]

In one of the leading cases on this subject, when the bids were opened, the contractor's engineer realized from the amount of the bid that he must have made a mistake in computing the bid and immediately called this to the attention of the party for whom the work was being done. The work in question was to be performed for the City of Rochester, New York. A local statute provided that once a bid is submitted, it cannot be withdrawn until the contract has been duly executed. Despite such statute, the court[2] permitted the contractor to rescind the bid on the ground that the bids as submitted was not the one the contractor intended to make and that the minds of the parties never met upon the terms of the contract. The court in its opinion stated that if a bid could not be withdrawn or rescinded where there has been a serious unintentional mistake it would place the contractor at the mercy of the other party and if through a mistake a contractor submitted a bid of $10.00 for doing a job worth $1,000,000, a court of equity would not stand by with folded hands and see the contractor driven into bankruptcy.

The above provision of the statute that once a bid is submitted, it cannot be withdrawn was circumvented by bringing the action to rescind the bid.

(1) General Electric Supply Corp. v. Republic Const. Corp., 272 P. 2d 291.
(2) Moffett, Hodgins & Clarke Co. v. Rochester, 178 U.S. 373.

(These summaries of court decisions are prepared by I. Vernon Werbin, New York attorney and civil engineer.)

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laid in one day!

Visualize more than a mile of header pipe with sufficient Stang Wellpoints to lower ground water level from 6 to 15 feet below subgrade *in 2000 foot sections.* That approximates the amount of dewatering equipment that Stang utilized in order to maintain a 1650 foot daily average (with a single-day high of 2300 feet) for the first two weeks on the job—amidst almost constant rainfall.

This 150 miles of 30-inch natural gas pipeline through southern British Columbia is being laid for the Pacific Northwest Pipeline Corporation by Sparling-Davis Co., Ltd. of Canada. In order to complete the 24 miles of dewatering required on the job within approximately 60 working days Stang field engineers contemplate stepping up the working schedule sufficiently to end up with a 2000 foot daily pipeline installation average for the entire job. Don't slow down your production because of groundwater—use Stang Wellpoints and engineering services to protect your job profits!

Putting water in its place

WRITE FOR BULLETIN 100-A,

JOHN W. STANG CORPORATION

Engineers and Manufacturers of Dewatering Equipment, Wellpoint and Pumping Systems
Dewatering Planning—Equipment—Service

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564

WHY LUFKIN CHROME CLAD TAPES last longer

Tempered steel tape.

Markings bonded direct to steel protected by higher surface of multiple electroplatings.

Multiple coats of electroplating.

Rust resistant coating.

Hard, smooth, non-glare chrome finish further protected by plastic coating.

EASY TO READ MARKINGS

Chrome Clad tape lines, a Lufkin exclusive, won't crack, chip or peel and are rust and corrosion resistant. Their jet black markings are easy to read and won't wear off. For longer wear try the Chrome Clad Leader — an example of a superior Lufkin tape with an "All-Metal" line. Has rust-resistant steel case covered with handsome vinyl. Replaceable lines. 25, 50, 75 and 100 ft. lengths.

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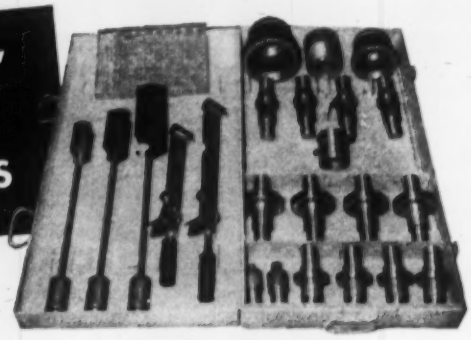
PRECISION TOOLS
FROM YOUR SUPPLY STORE

BETTER MEASURE WITH LUFKIN

THE LUFKIN RULE CO., Saginaw, Michigan

397

"IN-PLACE" SHEAR READINGS



FAST, ACCURATE, WITH NEW ACKER VANE TEST KIT!

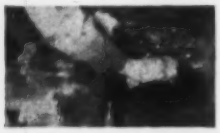
The Acker Vane Shear Test Kit has everything needed to obtain fast, accurate, "in-place" shear readings to depths of 100 feet!

It's easy to use and provides accurate soils information at low cost! For ease in carrying, the entire set of tools are packaged in a handy steel kit.

Write today for prices and free illustrated folder 700! ENR

Assemble the Vane to the Rod!

Insert in Casing and Apply Pressure to the Torque Wrench!



Consult the Torque Chart for Accurate Reading!

ACKER DRILL CO., INC. 725 W. Lackawanna Avenue Scranton, Penna.

a complete line of Soil Sampling Tools, Diamond and Shot Core Drills, Drilling Accessories and Equipment

Books

Architectural Elevations

DESIGN IN CIVIL ARCHITECTURE—By Sir Albert Richardson and Hector O. Corfiato, 216 pp. Philosophical Library Inc., New York, N. Y. $15

A diversified collection of architectural elevations has been assembled with accompanying captions in three languages—English, French and Russian.

The authors contend that an understanding and analysis of past architectural achievements can enhance present day design. Accordingly, they have surveyed those buildings that are outstanding examples of various architectural periods—Baroque, French Classic, Graeco-Roman, Renaissance and Romanesque.

Major elements of design that lead to harmony in an elevation, are briefly considered. The text describes aspects of horizontal and vertical subdivisioning of a facade, balanced grouping of masses, focal points on elevations, treatment of cornices, modelling of bases, entrance heights and structural materials.

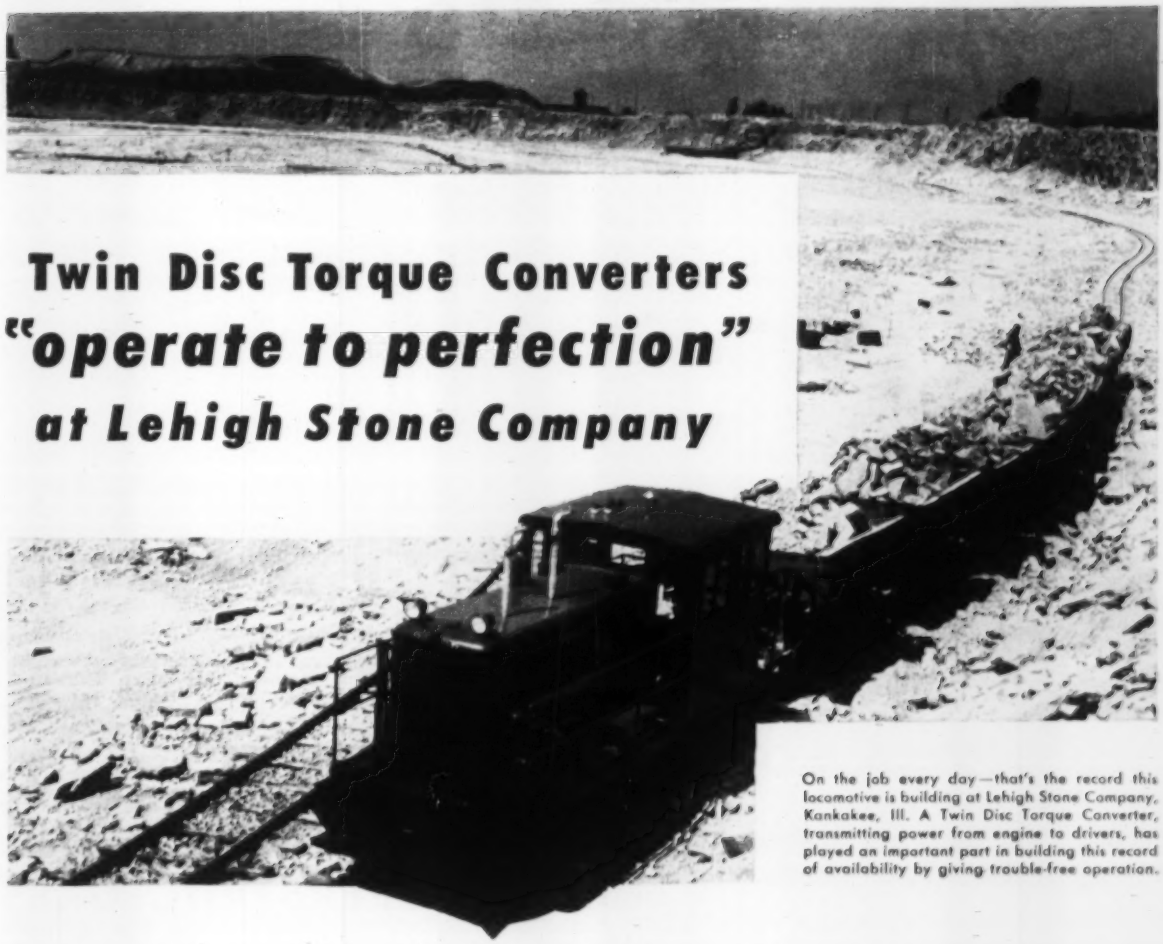
Elevational drawings that illustrate how ancient principles have been revived in modern structures comprise the major portion of this work.

The book is on the academic side, but it may serve as a refresher and guide to architects, and may be of interest to engineers who wish to learn more about architecture.

Miscellaneous Notes

• **Park and recreational structures**—Separate sections of a National Park Service publication dealing with the design and construction of park and outdoor recreational facilities are now available from the Superintendent of Documents, U. S. Government Printing Office, Washington, 25, D. C. for the following prices (in coin, money order or check, not stamps): Cabins, 40 pp, 30 cents; Picnic Fireplaces, 14 pp, 10 cents, Picnic Tables, 20 pp, 15 cents; Picnic Shelters and Kitchens, 28 pp, 20 cents; Barriers, Walls and Fences, 10 cents; Outdoor Theaters, 15 cents; Comfort Stations, 20 cents; Culverts and Bridges, 25 cents; Dams and Pools, 10 cents; Drinking Fountains and Water Supply, 20 cents; Historical Preservation and Reconstruction, 15 cents; Incinerators and Refuse Receptacles, 10 cents; Signs, 10 cents; Trail Steps, 10 cents; Washhouses and Laundries, 10 cents; Bathhouses and Dependencies, 10 cents; Concessions and Refectories, 10 cents; Lodges, Inns and Hotels, 15 cents; Miscellane-

Twin Disc Torque Converters "operate to perfection" at Lehigh Stone Company



On the job every day—that's the record this locomotive is building at Lehigh Stone Company, Kankakee, Ill. A Twin Disc Torque Converter, transmitting power from engine to drivers, has played an important part in building this record of availability by giving trouble-free operation.

A re-built pit locomotive—powered by an International UD-24 Diesel Engine, driving through a Twin Disc Torque Converter—was the result of a modernization program, by Lehigh Stone Company, Kankakee, Ill., that ingeniously utilized components from worn-out steam-driven locomotives.

"The original unit proved so successful that to date, four of these locomotives have been built. The result is a great saving in original cost over similar sized *new* locomotives, as well as a substantial reduction in operating cost, compared to steam.

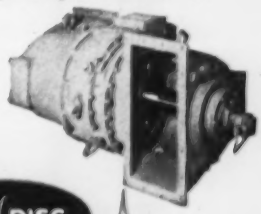
International UD-1091's, which replaced the UD-24's in later models, have identical dimensions, but provide more power and higher speed, which make them even more adaptable for use with the Twin Disc Three-Stage Torque Converters.

"The torque converters have operated to perfection, requiring no maintenance or repair other than changing oil and filter elements," states General Superintendent Delmor Groff. "In a recent haul test our tractive force was much better than expected."

Locomotive operators everywhere are finding similar results when Twin Disc Torque Converters are installed. Twin Disc Torque Converters permit smooth, fast acceleration . . . eliminate equipment-wearing shocks and stresses . . . provide maximum torque and tractive effort to the drivers—when needed most!

Specify a Twin Disc Torque Converter in your next locomotive or locomotive conversion. Take advantage of the many profit-making, cost-cutting features incorporated into Twin Disc Torque Converter Drives.

For complete details, write Twin Disc Clutch Company, Hydraulic Division, Rockford, Ill. Request Bulletins 135-E and 508 (three-stage and single-stage torque converters).

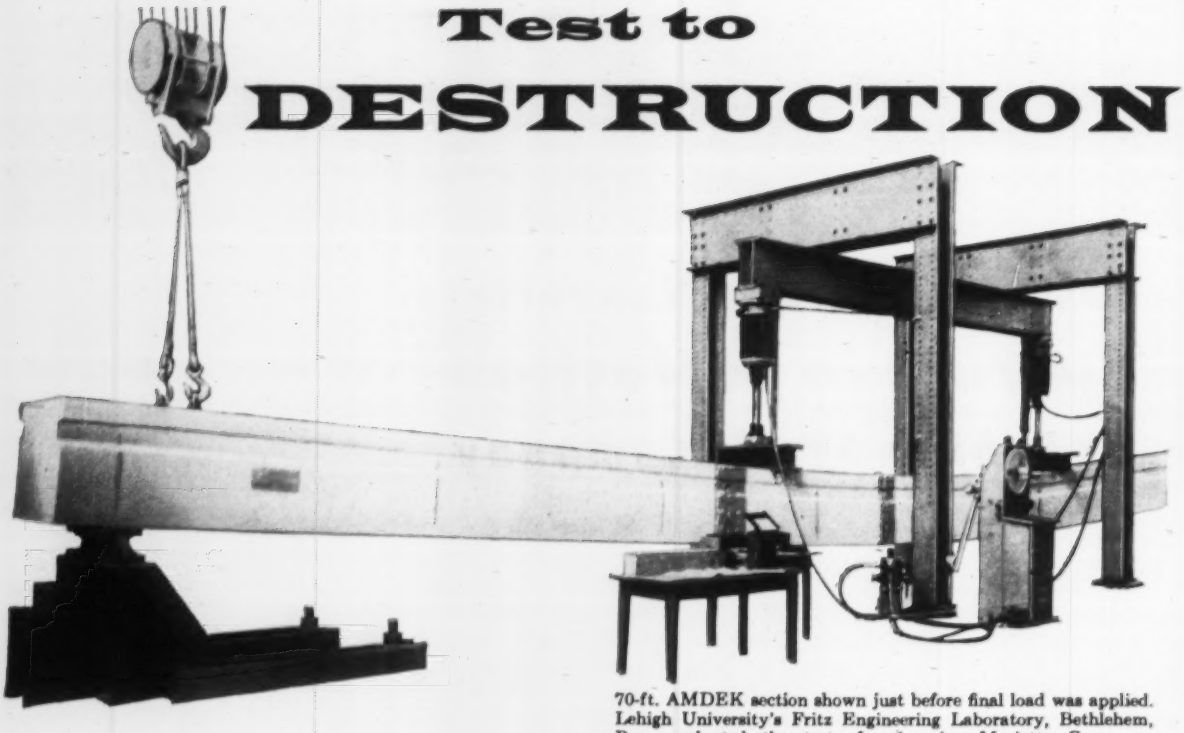


TWIN DISC

TWIN DISC
Torque Converters

TWIN DISC CLUTCH COMPANY, Racine, Wisconsin (Hydraulic Division) Rockford, Illinois

Test to DESTRUCTION



70-ft. AMDEK section shown just before final load was applied. Lehigh University's Fritz Engineering Laboratory, Bethlehem, Pa., conducted the tests for American-Marietta Company.

proves exceptional strength of

Prestressed Pretensioned Concrete BRIDGE SUPERSTRUCTURES

Thorough *FULL SCALE* testing of AMDEK design shows the "box section" develops superior rigidity, and strength. Prestressed, pretensioned, vacuum processed—and using special rectangular voids—AMDEK sections are stronger, longer, and lighter. Ease of handling has made AMDEK a favorite among erection engineers and contractors.

Save time—cut costs—build AMDEK bridges in days, that stay beautiful for years with little maintenance.

Copies of recent *FULL SCALE* tests using both static, and dynamic loading are available to bonafide engineering firms, and governmental agencies. Please send your request on your letterhead and ask for a representative to call on you.

Our technical staff will be pleased to assist you with your pipe problems.

AMERICAN-MARIETTA COMPANY
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ous Sport Structures, 10 cents; Boathouses and Dependencies, 10 cents; Entrance Ways and Checking Stations, 20 cents.

• **Vibration and impact studies** in girder bridges are reported on in Bulletin 124 of the Highway Research Board. The bulletin, entitled "Vibrations and Stresses in Girder Bridges," contains six papers sponsored by the Committee on Bridges and presented at the 34th annual meeting. The papers report on: measurements of dynamic deflections in five typical simple-span girder bridges; three kinds of dynamic effects on highway bridges; applications of electronic strain-recording equipment and results obtained in testing two 3-span continuous plate-girder bridges; vibration studies of a 3-span continuous I-beam highway bridge; vibration and deflection studies of an 8-span bridge containing both simple and continuous spans; and research on the highway bridge impact problem. Cost: $2.55. Write to Highway Research Board, 2101 Constitution, Washington, D. C.

• **Women's views**—"Women's Congress on Housing" is the title of a report published by the Housing and Home Finance Agency. It compiles the findings of 103 women, from all areas of the nation, who met last April to consider numerous aspects of home design and planning. The delegates discussed practical ways to meet family needs for living within various geographic and climatic areas. A series of diagrammatic sketches illustrate overall proposals of the congress. Also included are adjustments recommended in current design requirements, based on middle-income needs, local climate, customs and the basic essentials desired in a home. The 82 page report may be obtained for 60 cents a copy from the U. S. Government Printing Office, Washington 25, D. C.

• **Light-gage steel** specifications and design charts and tables have been updated in the second edition of the "Light Gage Cold-Formed Steel Design Manual." Reflecting the results of a research program conducted at Cornell University since 1939, determination of effective design width has been simplified, design provisions for multiple-stiffened elements and intermediate stiffeners have been added and provisions for avoiding web crippling have been improved. Also added are methods for determining the lateral bracing value of wall materials and structural properties of inverted U-sections. The 1956 edition can be obtained for $1 from the American Iron and Steel Institute, 150 E. 42nd St., New York 17, N. Y.

Save drafting and estimating time with this NEW GUIDE

for modular Facing Tile

This handy, slide-rule type tiling guide will save you time in computing sill, lintel and jamb requirements.

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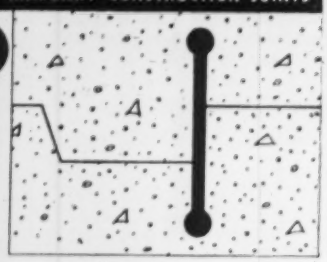
RUBBER
WATERSTOPS
FOR MASONRY CONSTRUCTION JOINTS



Williams Efficiency Waterstops are made from Natural Rubber Stock, and designed for maximum effectiveness in any type of cast-in-place construction joint. They will bend around corners—will not tear from shear action. Tensile Test: 3990 lbs.; Elongation Test: 650%. Available in rolls up to 80 feet in length. Field splicing is simple. Williams Waterstops can also be furnished in Neoprene for industrial uses where resistance to oil and other injurious wastes is desirable. These highly effective Waterstops are now in use in hundreds of industrial plants, commercial and public buildings throughout the country.

See Sweet's, or Write for Information.

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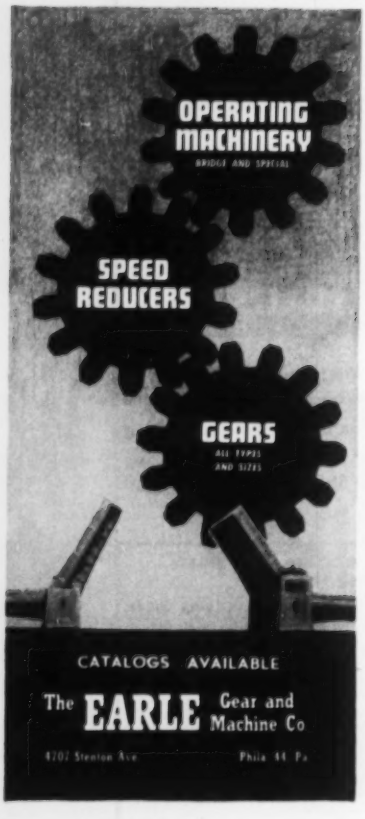
17928 Kinross, Birmingham, Michigan



Unit Prices

$53,342 Earthfill Dam in Texas

To prevent floods at Elm Fork of Trinity River near Muenster in Cooke County, Texas, 145,600 cu yd of earthfill will go into this dam and spillway. It is 1,400 ft long and 40 ft high. Ross W. Baker, Temple, Tex., is consulting engineer for the Soil Conservation Service, Temple.

The $53,342 C. A. Daniel Co. contract is 8.9% below the second low bid and 6.9% below the engineer's estimate.

Embankment rolling and placing drew bid prices ranging from $0.23 to $0.33 per cu yd. This includes backfill from excavation used as earthfill. Bids on unclassified channel excavation range from $0.60 to $1.48, on core trench excavation, from $0.18 to $0.60 and on special stream channel excavation from $0.18 to $1.00 per cu yd.

Class A concrete must contain six bags of portland cement per cu yd and test at 3,000 lb per sq in. in 28 days. Class B concrete requires four bags and a compressive strength of 2,000 lb.

Prevailing wage rates are $1.00 for unskilled labor, $1.10 to $1.50 for air tool operators, pipe layers, truck drivers; $2.00 for crane operators and graders.

1C C. A. Daniel Co., Garland, Texas	$53,342
2 John Corne l, Paducah, Texas	58,540
3 Roland L. Scherer, Weatherford, Texas	83,333
EE Ross W. Baker, Temp e, Texas	57,320

Bids: 9-20-56 Items	Unit	Quantity	Unit Prices 1C	2
Clear	ac	4	$70.00	$150.00
& grubb	ac	10	90.00	150.00
Excav, unclassif channel	cy	15,500	0.75	0.60
core trench, dry	cy	7,000	0.18	0.25
special stream chann	cy	1,100	0.18	0.30
Embankment, place & roll	cy	145,600	0.23	0.26
Conc, cl A	cy	15.58	60.00	70.00
cl B	cy	28.83	50.00	60.00
Steel, reinf	lb	1,274	0.15	0.20
RCP, 17" f&i	lf	228	7.25	10.00
CMP, bit ctd, galv, 18" 14-ga f&i	lf	40	6.00	7.00
Sluice valve & cut-off mechanism, 8" f&i	ea	1	120.00	175.00
Baffle plate, f&i	ea	1	35.00	75.00
Anti-vortex baffle, f&i	ea	1	200.00	275.00
Wire-fence & 2 gates, f&i	lf	3,479	0.22	0.30

Time to complete: 148 calendar days
Liquidated damages: $60 per day

Appomattox Bridge Substructure in Virginia

For its 814-ft bridge across Appomattox River at Petersburg, Virginia, Richmond-Petersburg Turnpike Authority, Richmond, let the $903,663 contract for substructure and deck to Blythe Brothers Company, Charlotte, North Carolina. This is 4.2% under the second low and 24.4% below the high fourth bid. Bethlehem Steel Company will furnish and erect the steel superstructure under a separate negotiated contract. Parsons, Brinckerhoff, Hall & Macdonald, New York, N. Y., are consulting engineers.

One 84.5-ft closed abutment, one 122-ft stub abutment, one 153-ft river crossing span and three 123-ft spans support a 66-ft deck. This carries two 28-ft roadways, two 2-ft safety walks, a 4-ft mall and two 1x1-ft parapets.

The contractor's price for class A tremie concrete is $35 per cu yd. For deck concrete it is $62.50. Deck surfacing is 9-in. reinforced cement concrete on a 2-in. and 4-in. soil aggregate base. Reinforced concrete approach slabs average 10.5 in. Excavation prices range from $0.60 per cu yd for borrow to $9.50 for unclassified in foundation.

Specifications require 6¼ sacks of cement per cu yd of class A concrete and a compressive strength of 3,000 lb psi.

Wage rates negotiated in agreement with the Virginia Road Builders Association are $2.30 to $2.825 for skilled labor, $1.90 to $2.20 for semi-skilled and $1.20 to $1.40 for unskilled labor.

Bidders include:

1C Blythe Brothers Co., Charlotte, N.C.	$903,663
2 T. A. Loving & Co., Goldsboro, N. C.	943,334
4 The Empire Constr. Co., Baltimore, Md.	1,195,169

Bids: 7-31-56 Items	Unit	Quantity	Unit Prices 1C	2
Protect RR traffic	ls	job	$1,000	$1,000
Clear & grubb	ac	4.8	350.00	450.00
Exc, regular	cy	600	0.65	0.60
borrow	cy	122,500	0.60	0.90
borrow, select	cy	570	0.95	1.50
Fill, porous	cy	1,110	1.20	2.00
CMP, asph ctd, 15", 16 ga culv	lf	610	1.00	1.00
bends	ea	8	50.00	50.00
End section, 15" flared	ea	6	50.00	50.00
Base course, soil agg type II, 2"	sy	1,600	0.45	0.40
type I, 4"	sy	4,460	0.57	0.65
Pavement, RCC, 9"	sy	4,004	8.50	6.00
Approach slabs, RCC, 10½"	sy	480	12.00	12.50
Bit matl, RC-2 or AEM-2	gal	1,300	0.19	0.20
Cover, agg, No. 9	t	24	6.00	5.50
No. 11	t	24	6.00	5.50
Concr, cl A, in deck, safety walks, parapets & malls	cy	2,410	62.50	60.00
Steel, reinf	lb	906,900	0.1325	0.135
Timber, treated	Mfbm	17.4	475.00	500.00
Railing, bridge, alum	lf	2,675	8.00	8.00
Scuppers, CI	ea	24	200.00	150.00
Drains, wi, 6"	lf	750	9.00	10.00
Conc, cl A, ftgs for piers, abutmts & wingwalls in piers, abutmts & wingwalls above ftg	cy	2,570	43.50	45.00
	cy	2,995	51.00	18.00
Concr, cl B, pipe encast	cy	88	36.00	55.00
Concr, cl A, in tremie seals	cy	1,970	35.00	50.00
Piles, bearing steel	lf	7,680	6.50	6.50
treated timber	lf	3,750	3.50	3.75
steel, test unloaded, stl bearing, load test	lf	270	12.00	12.00
	ea	5	1,000	800.00
Slope protect, prec conc block	sy	320	4.75	4.50
Exc, fndn, uncl	cy	2,530	9.50	9.00
Curb & gutter, conc, spec comb	lf	1,405	2.75	2.75
Drop inlet, std, DI-1 curb, special design, DI-2R	ea	2	300.00	225.00
	ea	8	350.00	280.00
Sod gutters & strips	sy	375	1.75	1.50
Riprap, conc, in bags	cy	324	35.00	35.00
Guard rail, steel beam	lf	448	3.50	1.00
Median strip, conc cl A, type MS-1ER	lf	682	5.50	6.25
Struct demolition of building A	ls	job	50.00	100.00
building B	ls	job	650.00	500.00
building C	ls	job	700.00	250.00
building D	ls	job	400.00	250.00
building E	ls	job	1,100.00	350.00
building F	ls	job	150.00	100.00
Topsoil, cl B, 2"	sy	13,820	0.18	0.20
Seeding	sy	13,820	0.04	0.04
Mulching	sy	13,820	0.04	0.10

Time to complete: 457 calendar days.
Liquidated damages: $500 per day.

Lick steep grades, spongy footing

build road-approach to Arkansas levee

Pulling 6½-yard loads uphill, over soft ground, 2 D Tournapulls with sideboards helped rebuild 2½ miles of Arkansas State Highway 1—from Pendleton north to the Arkansas River levee. Graves Brothers Co., of Pine Bluff, Arkansas, handled the dirtmoving for Linwood Smith, prime contractor to State Highway Dept.

Because of the length of haul and poor footing, Graves Bros. sent the 2 "D's" to build an inclined approach where Route 1 joins the levee. Short haul cut-and-fill work, in generally level terrain and sandy ground, was handled by a crawler-drawn scraper. Two graders (one an Adams 550) spread fill and regraded the 2½-mile stretch of road.

Up and down the levee-side

Tournapulls loaded in a bottom-land ditch at the foot of the levee. Pushed by a crawler-dozer, 138 hp "D's" heaped 6½ yards of sandy clay in an average 54 seconds, in 50 to 75 feet. After a 675′ uphill haul to the top of the levee, dirt was spread over 75 feet in 20 seconds. Tournapull's big low-pressure tires and exclusive power-transfer differential pulled loads through soft, slippery spots without loss of time or yardage. Downhill return to the borrow completed a 1500′ cycle.

"Handles fine on slopes"

Superintendent W. A. Cassity is well pleased with the way his "D's" worked the steep, Route 1 job. His records show the two rigs were consistently moving 185 to 200 loads in ten 54-minute hours. Cassity says, "These LeTourneau-Westinghouse D Tournapulls are good all-around dirtmoving machines."

Says operator H. R. Stephens, "I like Model D's 30 mph speed, and the maneuverability of electric steering. Rig is easy to handle, simple to maintain. It handles fine on steep slopes because it's powerful, low, and well-balanced."

157 miles in 6¼ hours

According to Supt. Cassity, the "D's" averaged better than 25 mph in traveling 157 miles over state roads, from Parkin to the job at Pendleton, Arkansas. On this trip, one Tournapull towed a trailer toolhouse, the other an extra 4-wheel trailing scraper.

Tournapull versatility

You'll find D Tournapull completely fills your needs for a fast, flexible, self-propelled scraper. It works economically on big jobs and small, over long or short hauls. In addition to general earthmoving work, "D" cuts ditches, shapes backslopes, finegrades, builds road shoulders, spreads gravel, handles clean-up. With optional blades or other attachments, rig dozes, back-fills around buildings and culverts, plows snow, and does a host of other handyman chores.

Improved "D" moves more dirt

To help you move more dirt, faster, the improved D Tournapull now has increased capacity of 9 yds. heaped, 8′ width, and permissable axle-load . . . requires no special road permit. Call or write for details.

D Tournapull with sideboards spreads 6½-yard load of sandy clay on roadway approach, as second scraper returns to bottom-land loading area out of camera range.

Tournapull—Trademark Reg. U.S. Pat. Off. DP-1037-H-b

LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

ARBA See you at the ROAD SHOW • Chicago • January 28-February 2, 1957

Materials and Labor Prices

Monthly Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES:

- Iron and Steel Products: Last, Oct 11; Next, Nov 15
- Wood Products, Glass, Explosives, Chemicals: Last, Oct 18; Next, Nov 22
- Clay Products, Lime, Plaster, Paint, Roofing: Last, Oct 25; Next Nov 29
- Wage Rates, Building Board, Lath, Insulation; Last, Nov 1; Next Nov 29

CEMENT, AGGREGATE, READY-MIXED CONCRETE—F. O. B. CITY

	PORTLAND CEMENT* Per bbl. C/L lots cash, dis. not deducted			SAND AND GRAVEL Per ton, carload lots			CRUSHED STONE Per ton, carload lots		CRUSHED SLAG Per ton, carload lots, f.o.b. plant		CONCRETE BLOCK 8x8x16-in.* truckload del.* per block		CONCRETE Ready Mixed 1:2:4 del. 50 cy & over
	Paper	Bulk	Mortar	Gravel, 1½ in.	Gravel, ¾ in.	Sand	1½ in.	¾ in.	1½ in.	¾ in.	Sand grav.	Lt. wgt. agg.	
Atlanta	$4.12a	$3.71a	$3.55	$2.75	$2.75	$2.50‡	$2.14	$2.24	$1.45	$1.65	$0.19	$	$13.75g
Baltimore	4.25c	3.82c	3.61c	2.80‡a	2.80‡a	2.25‡a	2.85‡a	2.90‡a	2.05‡a	2.00‡a	.18	.18a	12.75
Birmingham	3.73	3.00af		2.53n	2.53n	2.13n	2.75	2.75	1.55	1.65	.18	.18	12.30
Boston	4.91be	4.44a	4.71e	3.00a	3.00a	3.00a	1.65a	1.75a			.23	.275a	14.00k
Chicago	3.95a	3.57a	3.72	3.78‡b	3.78‡b	4.13‡b	3.95‡b	3.95‡b	2.25‡	2.25‡	.25	.25b	13.50
Cincinnati	4.22c	3.81c	3.90	2.19‡c	2.24‡c	2.24‡*	2.54‡c	2.54‡c			.205	.25a	12.40
Cleveland	N.A. in C.L.	3.59		2.15ef	1.95f	1.65	4.30‡a	4.30‡a	3.30‡a	3.30‡*		.23	16.15
Dallas	3.35a	2.95a	3.23	2.42	2.53	1.84	2.22	2.38			.11e	.2675	11.25
Denver	4.50a	4.00a	4.59	1.90	2.05	1.20					.22	.245a	10.70
Detroit	4.10a	3.45a*	3.73	4.25‡b	4.25‡b	4.00‡b	3.75‡	3.75‡	3.50‡	3.50‡	.23	.22a	14.20
Kansas City	4.30b	4.10b	4.10			1.70‡a	2.00‡a	2.00‡a			.20a	.24c	13.50b
Los Angeles	5.12eA	4.66eA	5.60	2.41‡a	2.76‡a	2.41‡a	2.41‡a	2.46‡a			.145/m	.255m	12.95A
Minneapolis	4.45a	4.05a	3.99	2.70‡ag	2.70‡ag	1.80‡ag	3.25‡ag	3.25‡ag			.19		14.00f
Montreal	3.11d	2.85d	3.50	1.95‡a	2.20‡a	2.25‡a	1.95‡s	2.20‡s			.20	.20a	10.80ek
New Orleans	3.70a	3.45a	3.75	2.44	2.44	2.00			1.45	1.65	.275		13.65
New York	4.85s	4.15a	3.88	3.05hk	3.05hk	2.15hk	2.90hl	2.90hl			.25	.30*	16.00sn
Philadelphia	4.03/4.42‡a	3.72/4.09‡a	3.64/4.27‡	2.85‡op	2.85‡op	2.35‡op	2.70‡	2.80‡	2.00	2.35	.23/.29		13.40dr
Pittsburgh	4.15a	3.76a	3.75	2.40‡	2.40‡	2.20‡	2.60‡	2.60‡	2.15	2.15	.25d	.31	14.00
St. Louis	3.97/4.15e	3.46/3.75e	3.71/4.03	3.25am	3.10am	2.40/3.10am	1.60j	1.70j			.22	.23e	12.40/12.90
San Francisco	3.79e	3.39e		2.02	2.02	2.12	2.17	2.17			.24	.24d	12.50c
Seattle	4.30a	3.75a		4.00‡bm	4.00‡bm	4.00‡bm	4.50‡bm	4.50‡bm			.26	.37	13.30y
Toronto	4.00	4.00	4.00	2.30‡	2.30‡	2.00‡	2.05	2.05	2.05	2.05	.25	.29a	15.05

‡ Delivered. * Prices incl. dealers discount except as noted.

CEMENT: *a Less 10¢ disc, 15 days. *b Less 2% disc, 15 days. *c Less 10¢ disc, 10 days. *d Truckload lots, deliv. 10¢ disc, 20 days. *e Truckload lots *f Fob mill, add $13.11 to $19.16 per car switching charges *g fob mill + freight *h LCL.

SAND, GRAVEL, STONE & SLAG: *a Truck lots. *b Per cu. yd. *c 5 tons or more. *e 1½". *f Pea gravel. *g Less 5% for cash. *h Less than 5 tons. *i Plus 5% mun. & prov. tax *j F.o.b. quarry. *k Barge lots add. *l F.o.b. scow Hudson river. *m Less 2% for cash. *n F.o.b. cars. *o 1-3 mi zone. *p Add 10¢ for ea. add'l mi zone.

CONCRETE BLOCK: *a Cinder *b Waylite. *c Haydite. *d Celocrete *e 8½ x 8 x 12 in. *f 8 x 4 x 16. *g F.o.b. truck at job. *i Less 2% for cash *j F.o.b. plant San Rafael. *m F.o.b. yard.

READY MIXED CONCRETE: *a 5 cu. yds. or over del. Man. *b 25 cu. yds or more *c 10-100 cy. brackets. *d 1-3 mi. zone. *e 2,000 lb comp. *f 2,500 lb. comp. *g Less 25¢ disc, 15 days. *h Less 50¢ for cash. *i 8% off for cash. *j 2% off for cash. *k Federal tax included. Add 5% mun. & prov. *l 1:2½:3½. *m F.o.b. yard *n Plus escalator clause. *o Add 15¢ for ea. add'l 3-mi zone.

CASH DISCOUNTS CEMENT to Contractors: Truck delivery, 2% for cash on 10th of month; on carload deliveries, no trucking, same as dealer cash discount 10¢ per bbl. for payment within 15 days of date of invoice. Subject discount 10¢ per bbl. 20 days in Montreal.

CURRENT MAXIMUM PRICES AT CEMENT MILLS

Charge for bags not included. For paper bags add 40¢ per bbl., not refundable.

	Bulk		Bulk		Bulk		Bulk		Bulk
Richard City, Tenn	$3.15†	Buffington, Ind	$3.10†	Steelton, Minn	$3.20†	Muskegon, Mich	$3.15†	Toledo, O	$3.15†
Clinchfield, Ga	3.15†	Independence, Kan	2.95†	Leeds, Ala	3.00†	Saginaw, Mich	3.15†	Milwaukee, Wis	3.20†
Kingsport, Tenn	3.15†	Hannibal, Mo	3.10†	Duluth, Minn	3.20†	Wyandotte, Mich	3.15†	Green Bay, Wis	3.20†
West Des Moines, Iowa	3.20†	Northampton, Pa	3.20†	Hudson, N. Y	3.20†	Buffalo, N. Y	3.25†	Ironton, O	3.15†
Nazareth, Pa	3.20†	Universal, Pa	3.20†	Alpena, Mich	3.05†	Oswego, N. Y	3.30†	Montreal City	2.85†
Bath, Pa	3.20†	Waco, Tex. (+ 10¢ tax)	3.10†	Detroit, Mich	3.15†	Cleveland, O	3.20†	W. Winfield, Pa	3.20†
Lesley, Pa	3.20†	Giant, S. C	3.25†	Howes Cave, N. Y	3.20†	Alsen, N. Y	3.20†	Security, Md	3.20†

† Prices to hold for Fourth quarter of 1956.

PAVING BRICK, BLOCK, ASPHALT, ROAD OILS—F. O. B. CITY

	PAVING BRICK AND BLOCK			PAVING ASPHALT		ASPHALT BINDERS—FLUXES		CUTBACK ASPHALT MC		ROAD OIL	ASPHALT EMULSION RSI	
	Granite Per M lots of 50,000 4x4x8 in.	Brick per M 3x4x8½ in. carload lots	Wood per sq. yd. 3½ in. 16-lb. treat	Per ton, less than 80 penetration		Per gal., 80-300 penetration		per ton		Per gal. Tank car	Per gal.	
				Tank car	Drums	Tank car	Drums	Tank car	Drums		Tank car	Drums
Atlanta				$27.60	$40.00	$0.15	$0.25	$0.114Pw	$0.276Pw	$0.18	$0.15	$0.25
Baltimore	150.00‡			23.00s		.095s	0.185s	10swE	19swE	.10¢	.105s	0.195s
Birmingham		62.00s										
Boston				22.00ap	35.00ap	22.00as	30.00as	095aFw	195*Fw	.095a	.095aG	.175aG
Chicago	150.00‡	85.00‡b	3.95/4.00‡j	21.85b	31.85b	20.85bs	30.85bs	10swH	18swH	.08b		
Cincinnati												
Cleveland		82.00d	6.30g	23.00A		23.00A		1025AwF			.1025AG	.20AG
Dallas	e	40.00	e	25.20	44.29	.1096	.1894	28.55	50.08	.1030	.1066	.1894
Denver		50.00										
Detroit		113.00		29.65		29.65s		1285swI		.1026		.38
Kansas City	e	e	e	7.00el		18.60s		085swJ		.075c	0.125	
Los Angeles	e		e	18.50dms		18.50dss		20.00dzK		19.00ds	.09j	.19j
Minneapolis			3.73A	26.50		26.50	0.115sw			0.105	.1242	
Montreal	e	e	e	27.00n	39.60n	135n	198n	16.90nswE	20.90nswE	.132n	.197ns	.239ns
New Orleans				17.65s	e	17.65s	e	085sw	e	.085B	.09BL	
New York			3.70f	23.80gCD	44.85qD	23.80gCD	44.85qD	1073wCDF	.1939wDF		.1073CD	.1939D
Philadelphia	175/185	110/120	4.06	22.00		22.00		095wF		.095		
Pittsburgh	165.00	48.00	4.60	27.00	38.00	10	.31	27.00E	40.00E	.098	.11	.224
St. Louis				20.63o		1764		0925fqM		0.16	.105	
San Francisco		70.00e		20.50g	37.50g	20.50gks	37.50gks	21.50gN	39.00gN	21.25s*	.0925g	.1825s
Seattle				24.50s	38.50s	18.75hs		26.00K		22.25hs	.0925h	.1025hr
Toronto			4.40	34.20	50.65	0.19	0.24	0.20sc	0.25sc	0.20	0.20	.24

‡ Delivered.

PAVING BRICK & BLOCK: *a CL. *b 3 x 4 x 8. *c 2½ x 8½ x 4. *d LCL, truck deliveries. *e Not used. *f 2" interior 8# treat. *g 3" *h 2" tr, 8# *i 3 x 3½ x 8½. *j 2½", 6 lb. tr.

ASPHALTS: *a Price at plant, Everett, Mass. *b F.o.b. refinery, Lockport, Ill. *c F.o.b. Sugar Creek, Mo. *d F.o.b. refinery, El Segunda. *e F.o.b. Baton Rouge. *f F.o.b. Hartford, Ill. *g F.o.b. Richmond, Calif. *h F.o.b. Martinez. *i F.o.b. refinery, Baltimore. *j F.o.b. refinery, Inglewood, Calif. *k 50-110 penetr. *l Less than 100 penetr. *m 40-80 penetr. *n Fed. tax included; add 8% for mun. & prov. *o Drums not avail. Shipped in steel bbl. *p 60-70 penetr. *q 40-85 penetr. *r In customer's drums. *s Shipped in drums, per drum. *t 85-200 penetr. *u Per 100 gal. *v Per ton. *w Per gal. *x Also tank trucks. *y F.o.b. Oakland *z F.o.b. Edmonds *A F.o.b. refinery, Cleveland. *B F.o.b. Destrehan, La. *C Bulk. *D Prices based on transporting to Manhattan via truck. *E RC. *F Also RC. *G Also MS, SS. *H RC 0-5 incl. *I MC 4. *J MC, RC .0675. *K MC 3, 4 & 5. *L MS. *M MC 1-5, RC 1-5, .086. *N MC 3. *O fob Roxanna, Ill *P F.o.b. refinery Savannah: $0.09/gal., tank cars; $0.20/gal., drums.

TraveLoader loads up to 600 yards per hour from stockpiles . . . moves and maneuvers fast to fill orders for material of various specifications . . . keeps big truck-fleet working steadily.

Cross-conveyor (optional), shiftable left and right, directs material to trucks at either side . . . speeds loading, cuts positioning time, balances load.

Cut truck-loading costs!

Speed handling of aggregates, loose dirt, topsoil with fast-loading TraveLoader

What is it costing you to load aggregates, surplus dirt, and other loose materials into trucks? Are you loading fast enough to keep your haulers busy? . . . to keep ahead of pavers? . . . to keep your jobs on schedule? You may find it worthwhile to re-examine your truck-loading methods carefully, then figure out where you might save time and money with a high-speed, rubber-tired Adams TraveLoader.

Handles big yardage fast

TraveLoader loads a truck in less than a minute from windrow, stockpile, or bank. It *loads up to 600 yards per hour* —dirt, sand, gravel, crushed stone, slag, topsoil, cinders, snow, and many other non-packed materials.

Here are a few typical applications where mobile TraveLoader heaps trucks faster at lower cost:

LOADS AGGREGATES: TraveLoader handles materials from stockpiles at aggregate plants, in materials yards, or rail-heads, for transport to ready-mix plant or job. Machine reduces truck waiting time . . . loads trucks in 40 to 60 seconds . . . moves and maneuvers quickly from one job to another at loading site . . . travels fast between plants and yards.

LOADS SURPLUS DIRT: TraveLoader picks up windrowed dirt in continuous motion, without scattering material. It works on road shoulders, loading to the rear . . . does not interfere with passing traffic . . . loads excess material from streets and between foundations in subdivisions.

STRIPS TOPSOIL: TraveLoader cuts and loads topsoil and other materials from field or natural bank without prior preparation.

TraveLoader digs and loads topsoil, sand, gravel, and other materials from natural bank without prior preparation.

Making clean 8′ wide pick-up, TraveLoader loads surplus material windrowed on road shoulder, without interference to passing traffic. AE-1105-H-b

These features cut your costs:

Power feeder on TraveLoader gathers material from a width of 8′ and places it on conveyor belt. Machine has 5 working speeds, 0.29 to 1.9 mph . . . travel speeds to 26.7 mph. Conveyor discharge height is adjustable from cab for filling trucks of any height without spillage . . . without excessive dust. TraveLoader heaps trucks at its rear, or with optional cross-conveyor, at either side . . . evenly distributes full load for fast over-the-road haul.

Cab is centered over conveyor — out of the dust zone — where visibility of material, feeder, conveyor, and trucks is good. Positive, convenient controls make loading simple . . . maneuvering and traveling as easy as driving a truck. TraveLoader is powered by either 55 hp gasoline or 60 hp diesel engine, machine weighs 16,700 lbs.

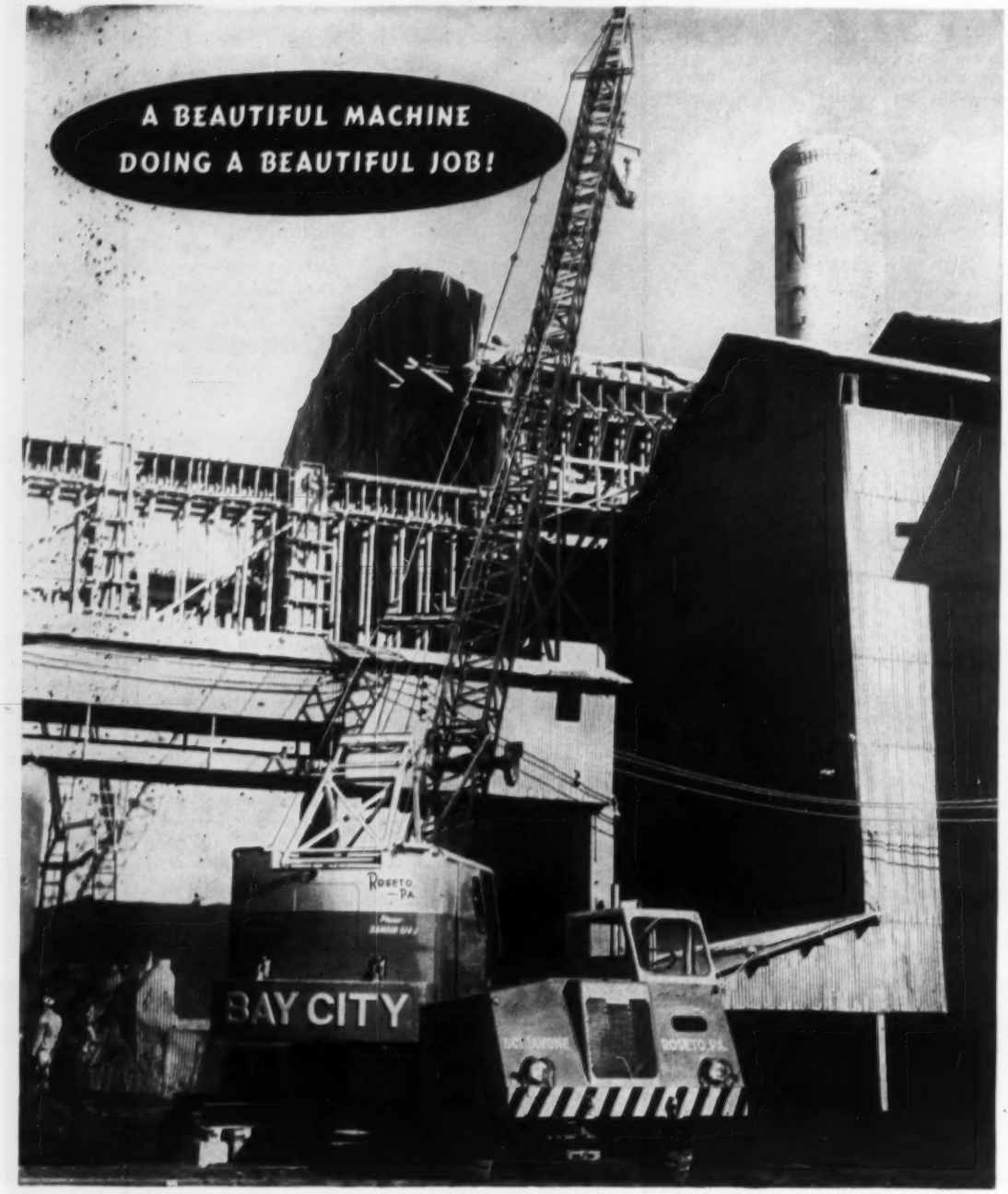
See TraveLoader at work

Make a date to see TraveLoader in action. See it load at the rate of a-truck-a-minute (including truck positioning time). That's the best way to appreciate its money-making possibilities on your work. Write or phone us for the names of users working TraveLoader on projects similar to yours.

LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

ARBA See you at the ROAD SHOW • Chicago • January 28-February 2, 1957



BAY CITY 25 TON CRANEMOBILE TAKES CONCRETE 105 FEET UP!

Equipped with 105 feet of boom, this BAY CITY 25 ton CraneMobile is placing concrete on a fast, smooth cycle in Nazareth, Pa. The CraneMobile will raise maximum boom from horizontal without help from another crane. An independent worm boom hoist raises and lowers boom or boom and load through reversing clutches under power, thus giving complete control of boom operations at all times. This highly mobile, rubber-tired BAY CITY is available in a range of capacities up to 25 tons, and in a selection of carriers to fit the job. High Gantry collapses for travelling to 11'-8" overall height and the pin-connected boom requires little time for boom length changes. Write today for your CraneMobile catalog or see your nearest dealer.

BAY CITY SHOVELS, INC. • BAY CITY, MICHIGAN

BAY CITY

SHOVELS • CRANES • HOES
DRAGLINES • CLAMSHELLS

261

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. WETZEL, L. M. FELIX, M. E. SCIORRA, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

HEAVY CONSTRUCTION—BA

† Mass., Boston—MAINTENANCE REPAIRS—BA 11/20—Dist. P. Wks. Office, First Naval Dist., 495 Summer St., Zone 10, maintenance repairs to Pier No. 10, Boston Naval Shipyard, NOy 91580, Spec 49733. Plans deposit $10. CD 10/4/55.

▲† Conn., Windsor Locks—HANGAR, etc.—BA On Or About 11/21—U. S. Eng., 150 Causeway St., Boston 14, Mass., maintenance hangar, $1,009,000-$1,500,000; base supply warehouse, $150,000-$250,000, Bradley Field, ENG-19-016-57-62. CD 5/16.

▲† Conn., Windsor Locks—PAVEMENTS, etc.—BA On Or About 11/27—U. S. Eng., 150 Causeway St., Boston 14, Mass., pavements and utilities Air Force Reserve Flying Center, Bradley Field, ENG-19-016-57-74. $900,000-$1,000,000. CD 5/16.

Conn., Hartford—BA 12/6—Office of N. B. Henson, city purch. agt., Municipal Bldg., 550 Main St., Zone 4, North and South Meadows Pumping Stations, 1956 Revisions. Plans deposit $50. Metcalf & Eddy, 1300 Statler Bldg., Boston, Mass., engrs.; adv. ENR 11/8. CD 9/18 and 10/3.

BUILDINGS—BA

Connecticut—HOUSING OFF-SITE IMPRVS.—BA On Or About 11/23—U. S. Eng., 150 Causeway St., Boston 14, Mass., off-site imprvs. and utilities, for Capehart Housing at Simsbury, Plainville and East Windsor, ENG-19-016-57-27. CD 6/1, under Unclassified.

▲ Connecticut—HOUSING—BA On Or About 11/27—U. S. Eng., 150 Causeway St., Boston 14, Mass., Capehart family housing, off-site imprvs. and utilities, Hartford Defense Area, at Simsbury, Plainville and East Windsor, ENG-19-016-57-27. CD 6/11, under Unclassified.

BUILDINGS—SLC

Mass., Groton—ACADEMIC—Lawrence Academy, Main St., soon lets contract academic bldg., classrooms and administration facilities. $500,000. Arland A. Dirlman, 739 Boylston St., Boston, Mass., archt. CD 4/9.

HEAVY CONSTRUCTION—LB & CA

Massachusetts—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,

Stephen P. Puffer, Jr., 64 Montague Rd., North Amherst, Mass., LB $80,571, highway work James St., Chicopee. Bids Oct. 23. CD 10/10.

BUILDINGS—LB & CA

Aberthaw Constr. Co., 60 State St., Boston, Mass., CA Approx. $800,000. 70,000 sq. ft. mfg. PLANT and OFFICE, DERRY, N. H. Kiev-Bro Shoe Mfg. Co., Inc., 98 Elm St., Derry, N. H.

John F. Griffin Co., 34 Regent St., Cambridge, Mass., CA $350,000. GUIDANCE CENTER, 110 Fenway St., BOSTON, MASS. Catholic Boys Guidance Center, R. C. Archdiocese, 1 Lake St., Brighton, Mass. Bids Aug. 29. CD 8/21.

J. J. Vaccaro, Inc., 511 Mystic Ave., Somerville, Mass., CA, Est. Approx. $100,000. Central POWER HOUSE, MEDFORD, MASS. Tufts University, Medford, Mass. Bids Oct. 9. CD 9/28.

Donatelli Building Co., Inc., 118 Cottage Ave., North Providence, R. I., LB $578,938. Thornton ELEMENTARY SCHOOL, southwest intersection Morgan St., Harcourt St. and Village Ave., CRANSTON, R. I. City, City Hall, Cranston, R. I. Bids Oct. 23. CD 10/8.

Giordano Constr. Co., 287 Main St., Branford, Conn., CA, Est. Approx. $100,000. 70x110 ft., frame, steel masonry GARAGE and SHOWROOM, BRANFORD, CONN. Branford Motor Co., Inc., 305 Main St., Branford, Conn. Chas. N. Abramowitz, 52 Goffe Terrace, New Haven, Conn., archts. Awarded Oct. 17.

MIDDLE ATLANTIC

BUILDINGS—BA

▲ Md., Baltimore—HOUSING—BA 11/20—Baltimore Housing Auth., 709 E. Eager St., Zone 2, Lexington Terrace Proj. MD 2-19, 677 units, 5 Highrise and 13 Sts., incl. central heating plant. $6,800,000. Plans deposit $100. Gaudreau & Gaudreau, 330 N. Charles St., Zone 1, archts. CD 6/27, under LB.

N. J., Port Newark—PLANT—BA 11/27—The Port of New York Auth., 111 Eighth Ave., New York 11, N. Y. Contract PN-380.002, Building No. 173 (bottling plant) paving and utilities at west side of Export St. Plans deposit $30. CD 6/19/51.

▲ Md., Baltimore—OFFICE—BA 11/29—State Dpt. P. Imprvts., 506 Park Ave., masonry, concrete, steel State Office Bldg., State Roads Bldg. $8,000,000. Plans deposit $150. Fisher, Nes, Campbell & Assoc., 1020 St. Paul St., Zone 2, archts. CD 10/16/52.

HEAVY CONSTRUCTION—LB & CA

The Port of New York Auth., 111 Eighth Ave., New York 11, N. Y., rejected bids Sept. 26, Contract PN-250.007, water mains under City Channel, PORT NEWARK, N. J. LB $543,500. CD 9/28, under LB.

▲ MARYLAND—State Rd. Comn., 108 E. Lexington St., Baltimore, Zone 2,

Md.—J. D. & C. M. Stuart, 3121 South St. N.W., Wash. 7, D. C. CA, $1,511,137. surf. 2.96 mi. divided by U. S. Rte. 240, Contr. M 485-16-320 Montgomery Co.;

Md.—Scott & Minbrow, Berlin, Md. CA, $453,692. Contr. D-279-1-120, grading, drainage, surf. 2.282 mi. State Rte. 16, Dorchester Co. Bids Oct. 9. CD 10/16, under LB.

▲ MARYLAND—State Rds. Comn., 108 E. Lexington St., Baltimore, Zone 2,

C. J. Langenfelder & Son, 8427 Pulaski Hy., Baltimore 24, Md. CA $2,965,459. Contr. B-635-11-420, grading, drainage, surf. 7.583 mi. dual hy., Baltimore Co. Beltway from Patapsco River to Wilkens Ave., Baltimore Co. Bids Oct. 2. CD 10/9, under LB.

Marocco Constr. Co., 231 S. Exeter St., Baltimore 2, Md. LB $77,466. (8 bidders) Contr. 523-S, lateral sewers, Reisterstown, TOWSON, MD. Comrs. Baltimore, co., County Office Bldg., Towson, Md. Bids Oct. 18. CD 10/11.

▲† William E. Cramer Co., Inc., 2601 Connecticut Ave. N. W., Wash., D. C. CA, $1,129,000. concrete steam distribution tunnel, Maximum Security bldg., St. Elizabeths Hospital, WASH., D. C. General Services Admin. P. Bldg Serv., General Services Bldg., Wash., D. C. Bids Sept. 12, awarded Oct. 24. CD 9/14, under LB.

BUILDINGS—LB & CA

▲ Piracci Constr. Co., 2552 Woodbrook Ave., Baltimore 17, Md. CA $1,895,000. brick, concrete, steel Marley JUNIOR HIGH SCHOOL, Baltimore and Annapolis Blvds., near Glen Burnie, ANNAPOLIS, MD. Anne Arundel Co. Bd. Educ., Annapolis, Md. Bids Sept. 25. CD 10/15, under LB.

Drummond & Co., Pikesville, Baltimore 8, Md. LB $117,868. grading, paving at Montebello State HOSPITAL, BALTIMORE, MD. State, Dpt. P. Imprvts., 506 Park Ave., Baltimore 1, Md. Knecht & Maxwell, 114 Reisterstown Rd., Baltimore 8, Md. archts. CD 7/13.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction
(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England
Middle Atlantic
South
Middle West
West of Mississippi
Far West

PROPOSED WORK

Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Public Buildings
Mass Housing
Commercial Buildings
Industrial Buildings
Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.
SOON LETS CONTRACT: SLC
LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.
CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

CD dates shown are of Construction Daily issue in which last previous report was published.

OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $2,000,000 or over.
ENR Engineering News-Record
CD Construction Daily

For additional reports see Construction Daily.

▲ Leimbach Constr. Co., 3906 Hickory Ave., Baltimore 11, Md. LB $3,696,350. 2 story masonry, concrete, steel Parkville SENIOR HIGH SCHOOL, Parkville, TOWSON, MD. Baltimore Co. Bd. Educ., Aigburth Rd., Towson, Md. Bids Oct. 16. CD 10/5.

▲† Victor R. Beauchamp Co., 431 Cedar St. N.W., Wash., D. C. CA, $1,327,619. PHYSICAL EDUCATION and ACTIVITIES BLDGS., Gallaudet College, WASH., D. C. General Services Admin., P. Bldgs. Service, 19 and F Sts. N.W., Wash. 25, D. C. Bids Oct. 4, awarded Oct. 25. CD 10/8, under LB.

Cafritz Constr. Co., 1404 K St. N.W., Wash., D. C., Owner Builds. $200,000. WAREHOUSE, 3 and Kennedy Sts. N.E., WASH., D. C. LeRoy Werner, 1404 K St. N.W., D. C., archt.

SOUTH

HEAVY CONSTRUCTION—BA

Fla., Fort Lauderdale—BA 11/19—W. J. Veeder, city mgr. City Hall, Section I, 6 wells and pumping stations; Section II, raw water mains, Section III, well field electrical distribution and appurtenances. Plans deposit $25. E. L. Patterson, city engr.; adv. ENR 11/8.

† Fla., Jacksonville—RESEALING—BA 11/20—Dist. P. Wks. Office, Building No. 12, U. S. Naval Base, Charleston, S. C., resealing airfield landing mat area, U. S. Naval Air Station, NBy-8682, Spec. 8682/56. Plans deposit $10. CD 8/27.

† Fla., Sanford—END ZONE STABILIZATION—BA 11/21—Dist.. P. Wks. Office, Building No. 12, U. S. Naval Base, Charleston, S. C., end zone stabilization, U. S. Naval Air Station, NBy-6495, Spec. 6495/56. Plans deposit $10. CD 8/27.

† S. C., Charleston—RAILROAD WORK—BA 11/21—P. Wks. Officer, Dpt. Navy, Naval Base, Charleston, railroad work and paving, Charleston Naval Shipyard, NBy-4989. Plans deposit $10. CD 6/25/52.

† Ala., Maxwell Air Force Base—DORMITORY—BA On Or About 11/27—U. S. Eng., 2301 Grant St., Mobile, Zone 7, WAF's dormitory, Maxwell Air Force Base, ENG-01-076-57-30. CD 8/23.

† Ala., Maxwell Air Force Base—APPROACH SYSTEM, etc.—BA On Or About 11/29—U. S. Eng., 2301 Grant St., Mobile, Zone 7, airfield lighting approach system and modification of threshold lights, Maxwell Air Force Base, ENG-01-076-57-32. CD 8/23.

† Fla., Eglin Air Force Base—COMMISSARY STORE—BA On Or About 11/29—U. S. Eng., 2301 Grant St., Mobile 7, Ala., commissary store, Auxiliary Field No. 9, ENG-01-976-57-29. CD 8/22.

BUILDINGS—BA

† Ala., Tuskegee—TRAINING CENTER—BA On Or About 11/21—U. S. Eng., 2301 Grant St., Mobile, Zone 7, Army Reserve Training Center, ENG-01-076-57-31.

▲ Ala., Livingston—TRAINING CENTER—BA On Or About 11/27—U. S. Eng., 2301 Grant St., Mobile, Zone 7, Army Reserve Training Center, ENG-01-076-57-28.

† Fla., Jacksonville—SHOP—BA 11/30—U. S. Eng., Box 4970, 1 story, 3,750 sq. ft. clay, brick Three Bay Maintenance Shop (FY-53), Training Center (North) ENG-08-123-57-19.

† Ga., Fort Benning—CLASSROOMS—BA About Dec. 16—U. S. Eng., 200 E. St. Julian St., Savannah, FY-56, battalion classrooms, ENG-09-133-57-12. CD 8/29.

HEAVY CONSTRUCTION—LB & CA

NORTH CAROLINA—State Hy. & P. Wks. Comn., Raleigh,

Nello L. Teer Co., Trust Bldg., Durham, N. C., CA $713,325, est. $400,000-$500,000, CABC bit. surf. tr. 6.95 mi. Proj. 9515, Jackson Co. Bids Sept. 25, awarded Oct. 24. CD 9/26, under LB.

▲ FLORIDA—State Road Dpt., Tallahassee,

Fla.—Cone Bros. Constr. Co., Box 1301, Tampa, Fla., CA, $1,093,813. limerock base with b. conc. drainage structures 9.671 mi. SR 5, F-003-5 (3) Job 7002-277, Brevard Co.;

Fla.—Coggin & Deermont, Chipley, Fla., CA, $490,194. shell stab. base with bit., sand-asph. hot mix surf., shell base wid'n., strips, 15.444 mi. SR 30 and 30-A, F-017-2 (9) and F-017-2 (10), Jobs 4909-201, 4901-202, 5101-204 and 5107-202 Franklin and Gulf Counties. Bids Sept. 20. CD 9/25, under LB.

▲ Sullivan, Long & Hagerty, Inc., 2028 2 Ave. N., Bessemer, Ala., CA, $2,247,942. sewage treatment plant, McDuffie Island, MOBILE, ALA. Mobile Co. Bd. Revenue, Court House, Mobile, Ala. Bids Oct. 16, awarded Oct. 23. CD 10/22, under LB.

MISSISSIPPI—State Hy. Dpt., Jackson,

Miss.—Worsham Brothers, Corinth, Miss., CA, $84,156. est. $90,000 grading, draining, culverts, base bit. 1.735 mi. Hy. No. 32, F-051-2 (7) Chickasaw Co.;

Miss.—O. J. Stanton & Co., Greenwood, Miss., CA, $548,459 est. $635,000, grading, draining, culverts, box bridge, bridges 11.409 mi. Miss. Hy. 25, F-0561 (2) Leake, Attalla and Winston Counties;

Miss.—Mid-State Paving Co., Meridian, Miss., CA, $198,711, est. $205,000 grading, draining, culverts, base, bit. 6.461 mi. Hy. 463 S-0516 (2)A, Madison Co. Bids Oct. 23. Grand total $831,326. CD 10/12.

LOUISIANA AND MISSISSIPPI—Mississippi State Hy. Comm., 712 Woolfolk Bldg., Jackson, Miss. and Louisiana Dpt. Hys., Hy. Office Bldg., Baton Rouge, La.

T. P. Groome, Contractor, Fayette, Miss., LB $353,554 East Pearl River Bridge, Rte. U. S. 111, State Proj. 740-002-02, Miss. Fed. Aid Proj. I-092-1 (3), St. Tammany Parish, La. and Pearl River Co., Miss. Bids Oct. 23. CD 10/9.

Oliver Meyer & Sons, 1115 Poland Ave., New Orleans, La., LB $381,767, sanitary sewerage sys., LOCKPORT, LA. Town, Lockport, La. Bids Oct. 7. CD 9/17.

Kentucky Road Oiling Co., 315 High St., Frankfort, Ky., LB $91,703, earthfill dam, Fish & Wild Life Reserve, S-472, Severn Creek, Owen Co., KENTUCKY. Div. Purchases, Commonwealth of Ky., Frankfort, Ky. Bids Oct. 19. J. B. Rieman, Capitol Annex Office Bldg., Frankfort, Ky., engr.

BUILDINGS—LB & CA

▲ **Brice Building Co.,** Box 1028, Birmingham, Ala., LB $1,134,635, general contract CAFETERIA and IBM OFFICE BLDG., BIRMINGHAM, ALA. Highland Properties Co., 505 19 St. (Ensley) Birmingham, Ala. CD 4/25.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

ILLINOIS—BA 11/15—Illinois State Toll Hy. Comm., 20 N. Wacker Dr., Chicago, Zone 6,

Contract N-3C, North Illinois Route, grading, drainage, paving, appurtenances, precast concrete bridges for approx. 6.18 mi. Northern Illinois Toll Highway in Constr. Section N-3C, beginning at point approx. 100 ft. east of Markley Rd., at Northern Illinois Toll Highway Centerline Station 931 plus 75 in Spring Township, Boone Co. extending easterly to point approx. 4,742 ft. east of Riley Rd. (TR 239) at Northern Illinois Toll Highway Centerline Station 1258 plus 41.87 in Riley Twp., McHenry Co. Plans deposit $25. adv. ENR 11/8. CD 11/3/55.

BUILDINGS—BA

† **Ill., Lemont**—HOUSING UNITS—BA 11/15—U. S. Eng., Merchandise Mart, Chicago, Army family housing 12-units at Special AAA site C-61, Argonne National Laboratory.

Mich., Oak Park—SCHOOLS—BA 11/20—City, Bd. Educ., School Dist. No. 3, Oak Park Zone 37, structural steel only for elementary school, at Greenfield and 10-Mile Road (first unit) Francis Scott Key School addn. Plans deposit $50 all contracts; Plans deposit separate plans, $25 (A) $20 (M) $20 (E). O'Dell, Hewlitt & Luckenbach, 950 N. Hunter Blvd., Birmingham, archts. CD 9/4.

BUILDINGS—SLC

Mich., Detroit—WAREHOUSE—Allen Industries Inc., 1850 Brewster St., soon lets contract warehouse addn., Alexandrine between St. Aubin and railroad I. M. Lewis, 25409 Sherwood St., Huntington Woods, Mich., archt.

HEAVY CONSTRUCTION—LB & CA

Speedway Contg. Co., 6001 N. 91 St., Milwaukee, Wis., CA, $206,729, main sanitary sewer in Laramie Lane, Bayside, MILWAUKEE, WIS. Metropolitan Sewerage Comn. of Milwaukee Co., Jones Island, Milwaukee, Wis. Bids Oct. 24, awarded Oct. 24. CD 10/8.

BUILDINGS—LB & CA

▲† **Malan Constr. Corp.,** 2 Park Ave., New York, N. Y. CA $1,427,000, RECREATIONAL-THEATER BLDG., Veterans Administration Center, DAYTON, O. Veterans Admin., Munitions Bldg., Wash., D. C. Bids Oct. 2. CD 10/4, under LB.

Seizer-Ornst Co., 6222 W. State St., Milwaukee, Wis., CA, Est. $100,000. 1 story, 88x143 ft. FACTORY addn., WAUWATOSA, WIS. Stroh Die Casting Co., 11123 W. Burleigh St., Wauwatosa, Wis. V. H. Esser, 4061 N. Prospect Ave., Milwaukee, Wis., archt.

▲ **Darin & Armstrong, Inc.,** 2041 Fenkell St., Detroit 38, Mich., CA Est. $1,000,000. ADMINISTRATION BLDG., employees facilities, Rawsonville, DEARBORN, MICH. Ford Motor Co., P. O. Box 117, Dearborn, Mich. CD 9/11.

Granger Brothers, Inc., 2702 S. Cedar St., Lansing, Mich., CA $355,613, general constr. CATHOLIC CENTER, Michigan State University Campus, EAST LANSING, MICH. Catholic Student Center, Michigan State University, East Lansing, Mich. Simpson & Hartwick, 1003 Bauch Bldg., Lansing, Mich., archts.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

Tex., Arlington—BA 11/16—Wm. J. Pitstick, city mgr., City, City Hall, Arlington, Contract D, water treatment plant, Section 2; Contract E, raw water pumping units; Contract F, wash water pumping unit. $300,000. Plans deposit $25. CD 9/17/54.

† **Mo., Grandview**—JET TEST CELL SOUND TREATMENT—BA On Or About 11/28—U. S. Eng., 1800 Federal Office Bldg., 911 Walnut St., Kansas City, Zone 6, constr. jet test cell sound treatment, Grandview Air Force Base, ENG-23-028-57-33. Plans deposit $5. CD 8/21.

† **N. M., Albuquerque**—BA About 12/5—U. S. Eng., P.O. Box 1538, Albuquerque, N. M., airmens mess hall and airmens dormitories, Kirtland Air Force Base, ENG-29-005-57-48. CD 8/24.

† **N. M., Roswell**—BASE CHAPEL—BA About 12/5—U. S. Eng., P.O. Box 1538, Albuquerque, base chapel, Walker Air Force Base, ENG-29-005-57-45. CD 10/20/55.

† **Montana**—BA 12/11—Bureau Reclamation, Dpt. Interior, Bldg. 53, Denver Federal Center, Denver 2, Colo., furnish two pumping units consisting of two vertical-shaft, 5,000 hp., Francis-type hydraulic turbines and two vertical-shaft, centrifugal-type pumps, each with capacity of 150 cfs under total head of 145 ft. for Helena Valley Pumping Plant, Missouri River Basin Proj., Inv. DS-4795, adv. ENR 11/8/56. CD 9/7.

BUILDINGS—BA

▲ **Mo., Columbia**—DORMITORIES, etc.—BA 11/27—Curators of University of Missouri, Dale O. Bowling bus. mgr., 116 Jesse Hall, Columbia, four 4 story, 115 ft. 4-in.x38 ft. 10-in. dormitories and 2 story, 101x191 ft. cafeteria, south group on Hitt St. $1,000,000. Hellmuth, Obata & Kassabaum, Inc., 315 N. 10 St., St. Louis 1, Mo., archt. CD 2/1.

BUILDINGS—SLC

▲ **Tex., Fort Worth**—DORMITORIES, etc.—Texas Wesleyan College, TWC Campus, Fort Worth, soon lets contract, 2 three story, brick, tile, concrete dormitories; 1 story dining hall. $2,000,000. Wyatt C. Herrick Co., 1200 T & P Bldg., archt. CD 10/15.

Tex., Houston—WAREHOUSE—Uvalde Rock Asphalt Co., 1705 Oliver St., soon lets contract, warehouse, Oliver St. off Washington Ave. $110,000. Kenneth Franzheim, 802 Lovett Blvd., archt. Ward Butterwick, 2303 La-Branch St., and H. E. Bovay, 5009 Caroline St., engrs. CD 10/3.

HEAVY CONSTRUCTION—LB & CA

Kaser Constr. Co., 3111 Ingersoll St., Des Moines, Iowa, CA, $107,562, Section No. 1, surfacing, resurfacing, WASHINGTON, IOWA. Washington Co., Court House, Washington, Iowa. Bids Oct. 8; (**Correction**—address of contractor). CD 10/17, under CA.

Northeast Telephone Co., Bogota, Tex. Own Forces $92,000, rural distr. sys., sys. imprvs., Bogota, TEXAS.

▲ **TEXAS**—State Hy. Dpt., Austin,

Tex.—**Hugh McMillan,** P. O. Box 1227, El Paso, Tex. and **Lee Moor Constr.,** 205 Bassett Tower, El Paso, Tex. CA, $1,025,579, flexible base, hot mix b. conc. 26.882 mi. Hy. US 62 and 180. Proj. S 149 (9), Hudspeth Co.;

Tex.—**Holland Page,** P. O. Box 1181, Austin, Tex., CA, $531,431, flexible base, b. conc. pavement, shell concrete, pavement widening and TCT Ry. overpass 2.174 mi. Hy. State 146. Proj. F 1081 (5), Galveston Co.;

Tex.—**J. M. Dellinger, Inc.,** P. O. Box 4227, Corpus Christi, Tex., CA, $633,391, flexible base, b. conc. 12.591 mi. Hy. US 77. Proj. F 373 (6), Lavaca Co.;

(Continued on Page 102)

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Because it is made of the ideal material — steel — ALCO steel pipe can withstand the impact of vibration, settlement, cave-in and washouts. Emergency pressures, surge and water hammer do not affect it. Steel pipe can be supported on piers at 40 ft centers or greater, to span marshes or ravines.

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Photo and Report by Interstate Industrial Reporting Service

Georgia red clay — often studded with quartz and granite — "routine" for Cleveland owner

CONCRETE CONSTRUCTION CO. of Atlanta, Georgia, recently completed a trench excavating job for the installation of a gas main in the North Druid Hills near Atlanta. "This area," says a report from C. V. Lanier, field superintendent for Concrete Construction, "contains quartz and—since the spine of Stone Mountain underlies the district—chunks of granite. But, using one of our Cleveland 95's, we consider it just a routine job." Concrete Construction currently operates nine Clevelands, three 92's, four 95's and two 110's. Mr. Lanier's report continues:

"Trencher operations constitute the basis of our business—and to us that means Clevelands. Mechanically, we have never had a Cleveland halt in the field."

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Good Everywhere

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(Continued from Page 100)

Tex.—F. & C. Engineering Co., P. O. Box 2426, Houston, Tex. CA, $566,064, flexible base, c. conc. 2.267 mi. Hy. US 90. Proj. I 149 (13), Orange Co.;

Tex.—Schwope Eng. Constr. Co., P. O. Box 15066, Houston, Tex., CA, $1,619,169, grading, structures, base, surf. 13.045 mi. Hy. FM 2279 and 1835. Proj. # 2-46-2-1, R 1747-1-2, Haskell and Stonewall Counties. Grand total $4,375,634. Bids Oct. 18, awarded Oct. 24. CD 10/24, under LB.

TEXAS—State Hy. Dpt., Austin,

R. C. Buckner, P. O. Box 609, Jacksonville, Tex., CA, $595,878, 2.743 mi. Hog Repress, Fish Lake, Log, W. Socagee and East Socagee Bridges and approaches 2.743 mi. Hy. US 79, Proj. F 806 (7), Panola Co. Bids Oct. 17, awarded Oct. 24. CD 10/22, under LB.

▲ TEXAS—State Hy. Dpt., Austin,

Tex.—L. H. Lacy Co., 5630 Yale Blvd., Dallas, and Elmer C. Gardner, P. O. Box 19071, Houston, Tex. CA, $1,570,111, c. conc. pavement, grade separation structures 3.181 mi. Hy. SH 183. Proj. F 634 (20), Dallas Co.;

Tex.—Gelvin-Terrell, Inc., P. O. Box 2268, Amarillo, Tex., CA, $734,589, flexible base, c. conc. 0.876 mi. Hy. US 60 and 87. Proj. U 60 (10), Potter Co.;

Tex.—J. R. Fanning & Co., Inc., P. O. Box 1278, Lubbock, Tex., CA, $667,630, grading, structures, FW & D overpass, flexible base, b. conc. 12.809 mi. Hy. US 287, Proj. 438 (26) and FG 438 (27), Childress Co.;

Tex.—Collins Constr. Co., P. O. Box 1192, Austin, Tex., CA, $713,641, flexible base, hot mix b. conc. 9.698 mi. Hy. US 84. Proj. F 137 (7), F 85 (4), F 138 (4) and F 463 (3), Freestone and Limestone Counties. Grand total $3,685,971. Bids Oct. 17, awarded Oct. 24. CD 10/22, under LB.

City, City Hall, Beaumont, Tex. Own Forces. $75,000, repairing and replacing water mains; $65,000, replace some water service lines, BEAUMONT, TEX. CD 9/6.

Reagan County Water Supply Dist., c/o I. Ashcraft, dist. pres., Big Lake, Tex. Own Forces. $50,000, water supply lines, BIG LAKE, TEX. CD 10/12.

City, Boerne, Tex. Own Forces. $75,000, storm sewers, BOERNE, TEX. CD 9/12.

Comrs. Cameron Co., Court House, Brownsville, Tex. Own Forces. $300,000, road imprvs. in Precincts Nos. 1, 2, 3 and 4, BROWNSVILLE, TEX. CD 6/14.

Briarcrest Country Club, Bryan, Tex. Purchase and Hire. $75,000, playgrounds, swimming pool, athletic courts; $75,000, golf course, BRYAN, TEX. CD 10/11.

City, Bryan, Tex. Own Forces. $60,000, concrete type water mains, BRYAN, TEX. Freese & Nichols, 407 Danciger Bldg., Fort Worth, Tex., engrs. CD 5/31.

City, Bryan, Tex. Own Forces. $75,000, sanitary sewers; $75,000, storm sewers, BRYAN, TEX. Freese & Nichols, 407 Danciger Bldg., Fort Worth, Tex., engrs. CD 5/31.

Pascal P. Paddock, Inc., Box 300 W. Warr Acres Branch, Oklahoma City, Okla., LB $98,700, rein.-con. swimming pool, FORT WORTH, TEX. Ridglea Swimming Pool Assn., Lackland, Fort Worth, Tex. Bids Oct. 23. CD 10/3.

City, City Hall, Galveston, Tex. Own Forces. $85,000, natural gas lines, GALVESTON, TEX. Freese, Nichols & Turner, 2111 C & I Life Bldg., Houston, Tex., engrs.

OKLAHOMA—State Hy. Dpt., Capitol, Oklahoma City, Zone 5,

Jones & Phillips, Norman, Okla., CA $87,746, est. $99,635, five concrete, steel bridges, Hy. 114, Cimarron Co. Bids Oct. 16, awarded Oct. 17. CD 10/8.

▲† Farnsworth & Chambers Co., Inc., P. O. Box 74, Houston, Tex., LB $19,400,000, academic complex except foundation caissons and steel, Air Force Academy, 05-613-57-3, COLORADO SPRINGS, COLO. Dpt. Air Force, Box 1670, Colorado Springs, Colo. Bids Oct. 23. CD 9/25.

BUILDINGS—LB & CA

G. F. Cook Constr. Co., 2833 Lyndale Ave. S., Minneapolis, Minn., CA $750,000, general constr. incl. equip. 1 story, bsmnt., 62x160 ft. dial telephone central OFFICE, Cedar Lake Rd. and Penn Ave. S., MINNEAPOLIS, MINN. Northwestern Bell Telephone Co., 224 S. Fifth St., Minneapolis, Minn. Magney, Tusler & Setter, 303 Roanoke Bldg., Minneapolis, Minn., archts.

Boran Builders, Inc., 5912 W. 35 St., Minneapolis, Minn. CA $793,645, married students' RESIDENCE HOUSING, approx. 100 units, St. Paul Campus, ST. PAUL, MINN. Regents of the University of Minnesota, C. A. Smith, purch. agt., 404 Administration Bldg., Minneapolis, Minn. Bids Oct. 18. CD 9/26.

Spartan Constr. Co., 6835 Natural Bridge Rd., St. Louis 21, Mo. Owner Builds. $700,000. 69 RESIDENCES Bellair Acres subdivision, east of Graham Rd., off Latty Rd., ST. LOUIS CO., MO.

Rogers Bedding Co., Box 808, Brenham, Tex. Own Forces. $100,000. FACTORY, BRENHAM, TEX. CD 10/2.

Prokop Building Co., Inc., 6905 Long Point St., Houston, Tex. Own Forces. $383,000. 26 DWELLINGS, HOUSTON, TEX. CD 8/23.

FAR WEST

HEAVY CONSTRUCTION—BA

† California—BA 11/29—Bureau Reclamation, Dpt. Interior, Bldg. 53, Denver Federal Center, Denver, Colo., Sch. Item 1, valve with control unit and cabinet, valve support metalwork, anchor bolts, appurtenant equip. and one set of handling equip., for outlet works at Casitas Dam, Ventura River Proj., Spec. DC-4791. CD 4/14/44.

HEAVY CONSTRUCTION—LB & CA

▲ IDAHO—State Hy. Dpt., Boise,

Fred Slate Co. Oregon Ltd., 7805 S. W. 40 Ave., Portland, Ore., and E. E. Hall Co., 12012 S. W. Barbur Blvd., Portland, Ore., CA $2,731,683, roadway, plant mix bit. surf. 7.184 mi. U. S. 10, Kootenai Co. Bids Oct. 16. CD 10/22, under LB.

† M. W. Brown, P. O. Box 827, Redding, Calif., LB $696,866, est. $676,257. (9 bidders) earthwork, structures, surf. for connecting access road, Hy. 299 to Trinity River Crossing, Central Valley Proj., Spec. DC 4762. CALIFORNIA, Bureau Reclamation, Dpt. Interior, Weaverville, Calif. Bids Oct. 23. CD 9/11.

† Peninsula Pipelines, Inc. & Ince Bros., 616 E. Taylor St., Sunnyvale, Calif., LB $111,094, est. $59,885, (2 bidders) water supply sys. from Trinity Govt. Community Facilities, Trinity River Div., Central Valley Proj., Spec. DC 4770, CALIFORNIA, Bureau Reclamation, Dpt. Interior, Weaverville, Calif. Bids Oct. 23. CD 9/26.

Western Alta Pool Co., 325 Anna Maria St., Altadena, Calif., LB $289,000. (3 bidders) swimming pool and bathhouse, HAWTHORNE, CALIF. Hawthorne City Council, City Hall, Hawthorne, Calif. Bids Oct. 22. CD 10/10.

BUILDINGS—LB & CA

Secrest & Fish, 109 W. Whittier Blvd., Whittier, Calif., LB $646,408, est. $734,000. reinforced masonry, Telegraph Elementary SCHOOL, SANTA FE SPRINGS, CALIF. Little Lake School Dist., 10515 S. Pioneer Blvd., Santa Fe Springs, Calif. Bids Oct. 23. CD 10/2.

Pacific Co., 801 Cedar St., Berkeley, Calif., LB $385,950. (7 bidders) elementary SCHOOL, near SEBASTOPOL, CALIF. Gravenstine Union School Dist., Mt. Vernon School, Cunningham, Calif. Bids Oct. 18 CD 10/18.

CANADA

BUILDINGS—SLC

Que., St. Henri de Mascouche—JUVENAT, etc.—Freres St. Gabriel, St. Henri de Mascouche, soon lets contract, 2 story, no bsmnt., 44x247 ft., brick, stone juvenat, chapel, etc. $360,000. J. Armand Dutrisac, 1069 Beatty Ave., Verdun, archt. Archambault & Roy, 2125 Jean Talon St. E., Montreal, Que., engrs.

HEAVY CONSTRUCTION—LB & CA

T. C. Gorman (NS) Ltd., 505 Roy Bldg., Halifax, N. S. LB $315,991. wharf replacement, TIVERTON, N. S. Dpt. P. Wks., Hunter Bldg., Ottawa, Ont.

(Continued on Page 104)

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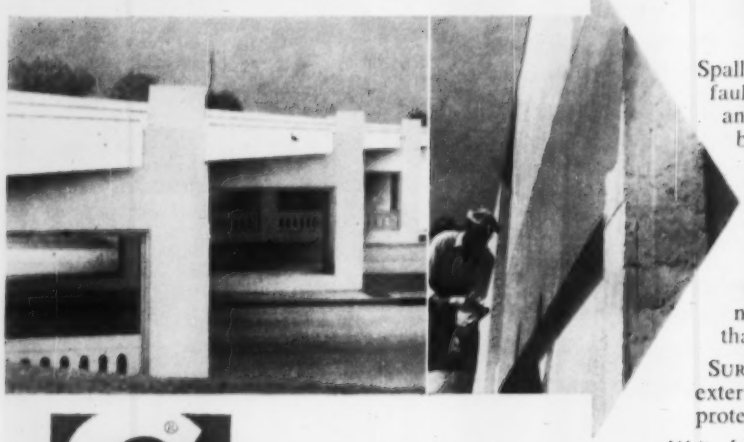

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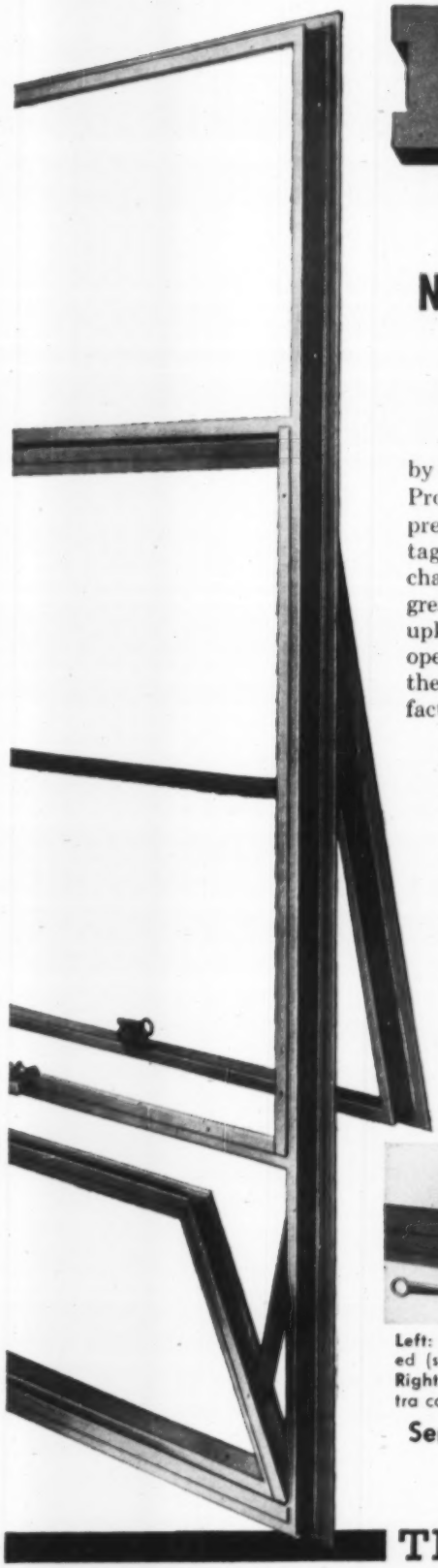

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Featuring new one-piece solid hot-rolled sections assembled by machine welding, this new Bayley Steel Heavy Intermediate Projected Window now offers you a window that exceeds all present industry standards. It retains the time-proven advantages of Bayley section design *plus* new shape and weight characteristics, hardware and fabrication details that result in greater strength, better weathering and maximum freedom from upkeep — an extraordinary dollar value in window service and operating qualities. The features listed below readily reflect the Bayley window engineering experience and modern manufacturing methods embraced in this new window.

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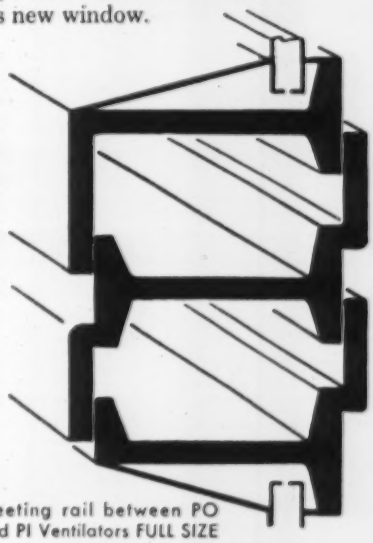
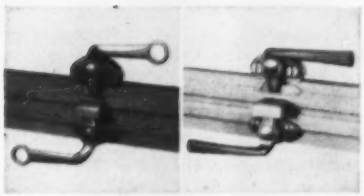


Meeting rail between PO and PI Ventilators FULL SIZE



Left: Steel handle fastener, lacquered (standard)
Right: Bronze handle fastener (at extra cost)

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(Continued from Page 102)

John Patterson Constr. Co. Ltd., 23 Church St. W., Brampton, Ont. LB $141,507. 123 ft. rein.-con. bridge, abutments, approaches and roadways on Steele's Ave. at Woodland Park, GORMLEY, ONT. Markham Twp., R.R. 2, Gormley, Ont. Bids Sept. 24. CD 9/19.

Foundation Co. of Ontario Ltd., 1220 Bay St., Toronto, Ont. LB $249,347. Bayview Ave. bridge over east branch of Don River, south of Steele's Ave., TORONTO, ONT. Municipality of Metropolitan Toronto, 67 Adelaide St. E., Toronto, Ont. Bids Oct. 22. CD 10/5.

Canadian Comstock Co. Ltd., 206 Laird Dr., Toronto, Ont. CA $263,259. (5 bidders) supplying, installing (a) complete heating and ventilating systems (b) mechanical equip., incl. four 20,000 gal diesel fuel oil tanks, hydraulic flow pressure instruments and complete automatic vacuum priming system, John St. Pumping Station, TORONTO, ONT. Municipality of Metropolitan Toronto, 67 Adelaide St. E., Toronto, Ont. H. G. Acres & Co. Ltd., 1259 Dorchester Rd., Niagara Falls, Ont., engrs. CD 9/3/54.

▲ **Dominion Structural Steel Ltd.**, 6894 Cianranald Ave., Montreal, Que. LB $4,690,780. Valleyfield vertical lift bridge over ship channel, Beauharnois Canal Soulanges Section of St. Lawrence Seaway; LB $4,448,666, St. Louis vertical lift bridge over ship channel, Beauharnois Canal, Soulages Section of St. Lawrence Seaway, QUEBEC. St. Lawrence Seaway Auth., No. 2 Temporary Bldg., Ottawa, Ont. A. Gordon Murphy, c/o owner, 685 Cathcart St., Montreal, Que., ch. engr.

Union Quarriers & Paving Co. Ltd., 495 Second Ave., Quebec City, Que. CA, $189,000. water mains, sewers, etc. in DONNACONA, QUE. Municipality, Donnacona, Que. Awarded Oct. 17. CD 9/7/48.

BUILDINGS—LB & CA

▲ **Deli Constr. Co. Ltd.**, 2461 Bloor St. W., Toronto, Ont. CA, $2,246,400. 3 story, 60x260 ft., 2 story, 60x100 ft., rein.-con., stone, brick MUNICIPAL BLDG., and 60x140 ft. ADMINISTRATION BLDG., Hy. 27 and Burnhamthorpe Rd., TORONTO, ONT. Etobicoke Twp., 4969 Dundas St. W., Islington, Ont. Awarded Oct. 17. CD 3/22/55.

J. Euclide Perron Ltee, 37 Jacques Cartier Blvd. E., Chicoutimi, Que. CA, $500,000. three 12-unit APARTMENT BLOCKS, and 18 detached HOUSES, BAIE COMEAU, QUE. Canadian British Aluminum Co. Ltd., 1980 Sherbrooke St. W., Montreal, Que. Awarded Oct. 17. CD 10/5.

LATIN AMERICA

HEAVY CONSTRUCTION—LB & CA

▲ Low bidders **Acqueductos Transandinos S. A., Cilliniz-Olazabal-Urquiaga and Bertolero y Cia**, Lima, Peru offers $15,675,000 to be repaid by Government in 25 years for Marcopomacocha Project, for water supply and irrigation, Santa Eulalia River, incl. 10-12 kilometer tunnel through Andes, dam at Antacoto, canals, roads, PERU. Ministry of Development & P. Wks., Lima, Peru. CD 4/1/55.

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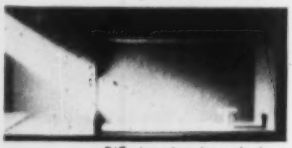
"Smoke box" photo—window glazed with clear glass.



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PROPOSED PROJECTS

WATER SUPPLY

▲ **N. J., Jersey City**—City, City Hall, dam across Rockaway River to empound flood waters for release to lower reservoir at third reservoir for Jersey City Water Supply, Longwood Valley near Rockaway. Est. over $7,000,000. Havens & Emerson, 322 Broadway, New York, N. Y., consult. engrs. Harold Ohland, City Hall, city engr.

S. D., Sioux Falls—City, City Hall, voted $500,000 bonds Oct. 9, WW imprvs. CD 9/27.

Tex., Brownsville—City, voted bonds Oct. 13, WW rehabilitation, $50,000; water lines, $750,000; elevated or ground water storage, $150,000. CD 9/26.

▲ **Tex., Odessa**—City, voted bonds Oct. 20, water lines, rehabilitation work, $1,100,000; water storage, $75,000.

▲ **Wis., Milwaukee**—City, City Hall, water intake pumping stations, filtration plant, water mains, booster stations, etc., $49,250,000. Black & Veatch, 4706 Broadway, Kansas City, Mo., consult. engrs. CD 12/6.

SEWERS, WASTE DISPOSAL

▲ **Fla., Clearwater**—Pinellas Co., Court House, sewerage collection sys. and treatment facilities. $6,750,000.

Kan., Olathe—City, sewer mains, pumping stations, enlarging treatment plant, constr., replace mains and hydrants. $725,000.

Mo., St. Louis County—Metropolitan St. Louis Sewer Dist., William Q. Kehr, exec. dir., 506 Olive St., St. Louis, Zone 1, defeated $675,000 bonds Oct. 16, sys. of trunk and sub-trunk sewers to serve Sub Dist. 1 of Ten River Des Peres Watershed (Creve Coeur and Frontenac area) of some 10 square miles bounded by district limits on west, 3 mi. west of Lindbergh Blvd. Project indefinitely postponed. CD 9/28.

▲ **N. J., Eatontown**—Eatontown Sewer Auth., Benj. Van Keuren, secy., Borough Hall, sewage treatment plant and pumping station and sewerage sys. for developed portion of borough. $1,500,000. Lanning Eng. Co., 1100 S. Broad St., Trenton, consult. engr. Bids in March. CD 6/30/50.

▲ **N. Y., Lancaster**—Village, Village Hall, Harold J. Huber, Pub. Wks. Supt., sanitary sewerage sys., southwest corner of village. $1,900,000. Krehbiel & Krehbiel, 2000 Sheridan Dr., Tonawanda, consult. engrs. CD 5/18.

▲ **O., Hamilton**—City, City Hall, sewage disposal plant at Riley's Island, $3,208,000. Bids soon. CD 6/1/49.

O., Marion—City, City Hall, trunk sanitary sewers to serve east and southeast sects. of city, Indiana Ave., Forest Lawn Blvd., Mt. Vernon Ave. $649,000. Floyd G. Browne & Assoc., Marion, consult. engr.

▲ **O., Warren**—Comrs. Trumbull Co., Court House, sewage disposal sys. to serve Lordstown and new General Motors plant. $2,413,700. Willard F. Schade & Assoc., Chester-12th Bldg., Cleveland, Zone 14, consult. engrs.

Okla., Claremore—City, City Hall, defeated $510,000 bonds Oct. 9, sewage disposal plant, Black & Veatch, 4706 Broadway, Kansas City, Mo., consult. engr. CD 9/24.

▲ **Pa., Phila.**—City, Dpt. Procurement, City Hall Annex, 600 ton northwest incinerator, Umbria St. and Domino Lane, Manyunk, Condemning site. $2,000,000. To go ahead in 1957.

Tenn., Columbia—City, City Hall, sewage treatment plant, $750,000. CD 1/27/47.

Tex., Abilene—City, A. P. Hancock, mgr., City Hall, sewage treatment plant and pump station. $500,000. Freese & Nichols, 407 Danciger Bldg., Fort Worth, consult. engrs.

▲ **Tex., Odessa**—City, City Hall, voted bonds Oct. 20, sanitary sewer lines, $875,000; sewage disposal unit, $175,000; storm sewers, $90,000.

Wash., Pasco—City, City Hall, 72 in. storm sewer along Railroad Ave. to Yacht Basin, $700,000. Cornell, Howland, Hayes & Merryfield, Corvallis, Ore., consult. engrs. CD 12/11/53.

▲ **Ont., Windsor**—City, City Hall, sewage disposal plant, interceptors, pumping stations, storm water relief sewers, $20,000,000-$22,000,000. Gore & Storrie, Ltd., 1130 Bay St., Toronto, engrs. CD 6/16/54.

BRIDGES

Ill., Aurora—City, City Hall, bridge, Ashland and Holden Aves. $750,000. Walter E. Deuchler Assoc. Inc., 63 S. LaSalle St., consult. engr. CD 5/31/51.

▲ **Wis., Milwaukee**—City, City Hall, Hawley Road Viaduct, $2,500,000. E. A. Schmidt, city engr. George C. Ashton, br. engr. CD 6/7/54.

▲ **Wis., Milwaukee**—City, City Hall, S. 35 St. Bridge over C & N. W. R. R. tracks, $1,100,000. E. A. Schmidt, city engr. George C. Ashton, br. engr. CD 8/25/54.

(Continued on Page 106)

New Shopping Center Features Low Cost Construction with J&L Junior Beams

"Our cost estimates comparing various structural systems showed that 40 foot J&L Junior Beams used across two 20 foot spans proved to be the most economical type of construction." That's how Mr. Hymen Rosenberg, AIA, summed up the reason he specified 55 tons of 10 inch Junior Beam roof purlins in the ultra-modern Pines Shopping Plaza at Perrysville, Pa.

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STEEL CORPORATION · PITTSBURGH

Architect: Hymen Rosenberg
General Contractor: Sam Verman
Steel Fabricator: Levinson Steel Company

(Continued from Page 104)

▲ **Wis., Milwaukee**—City, City Hall, bridge over Kinnickinnic River at E. Greenfield Ave., incl. approaches, relocation of sewers, etc. $4,850,000. E. A. Schmidt, city engr. George C. Ashton, br. engr.

STREETS AND ROADS

▲ **CONNECTICUT**—State Hy. Dpt., 165 Capitol Ave., Hartford.

Waterbury—Waterbury Expressway between Hamilton Ave. and Route 70 at Cheshire Town Line. $1,000,000.

Conn., New Haven—City, City Hall, paving and resurfacing various streets. $500,000. Wm. Bolton, city engr. CD 8/20/43.

▲ **Ill., Chicago**—City, City Hall, Northwest Superhighway, further expenditure authorized, $500,000. CD 2/13/45; West Route Superhighway (Congress Street Development) authority granted for further expenditure $1,500,000. CD 4/26/45; repaving W. 69th St. from Western to Vincennes Aves. 15,000 ft., authority granted, $300,000; repaving W. 71st St. from Western to Vincennes Aves. 15,000 ft., authority granted, $600,000; repaving W. and E. Harrison St. from W. Ogden to S. Clark and from S. State to S. Wabash, 12,000 ft., $250,000; repaving S. Wabash Ave. from 51st to 32nd Sts., 12,500 ft. $200,000.

▲ **MICHIGAN**—State Hy. Dpt., Stevens T. Mason Bldg., Lansing,

Oakland and Livingston Counties—Northwestern Hy. conversion to limited access 4-lane hy. (1) Orchard Lake to M-59 (2) Orchard Lake Rd. to 8-Mile Rd., incl. 13 interchanges, 14 grade separations. $37,000,000. To go ahead in 1957, Carlos A. Weber, ch. engr.

▲ **NEW YORK**—Bureau Contracts & Accounts, The Gov. Alfred E. Smith State Office Bldg., Albany,

Westchester Co.—10.3 mi. Cross-Westchester Expressway from N. Y. Thruway at Elmsford east thru White Plains to New England Thruway at Rye. $32,000,000. Charles H. Sells, 70 E. 45 St., New York, Zone 17, consult. engr. CD 1/17.

▲ **OHIO**—State Hy. Dpt., Columbus,

Stark Co.—Canton North-South Expressway from Navarre to Gibbs Rds., incl. relocation of Rte. 8 and parts of Rte. 62. $15,785,110. Michael Baker, Jr., Baker Bldg., Rochester, Pa., consult. engr. CD 9/5/55.

Okla., Watonga—Blaine Co., Watonga, bond election Nov. 20, county highways. $600,000. Roy B. Parka, Watonga, engr.

Tex., Brownsville—City, voted bonds Oct. 13, street paving, $550,000. CD 9/26.

▲ **Tex., Odessa**—City, City Hall, voted bonds Oct. 20, street imprvs., paving, $1,185,000.

▲ **Wis., Milwaukee**—City, City Hall, street imprv. program for 1957. $2,750,000. E. A. Schmidt, city engr.

EARTHWORK, WATERWAYS

▲ **Calif., Martinez**—Contra Costa Flood Control Dist., Court House, bond election Dec. 4, waterways imprvs., Zone 3-B, Contra Costa Co. $9,875,000.

Tex., Kermit—Winkler Co. (Forming Water Control & Imprvt. Dist.) irrigation project. $500,000.

Tex., Longview—Cherokee Water Co., c/o Judge Fred Erisman, Domestic Water Retention Dam 2, at Silvey Bridge. $750,000.

▲ **Washington**—Cowlitz County Public Utility District, Longview, Wash., and Pacific Power & Light Co., 920 S.W. 6 Ave., Portland, Ore. Muddy hydro project on Lewis River at Eagle Cliff, $28,000,000. Bechtel Corp., 612 S. Flower St., Los Angeles, Calif., consult. engrs.

AIRPORTS

▲† **Md., Andrews Air Force Base**—DORMITORY, etc.—U. S. Eng., 1st and Douglas Sts. N. W., Wash. 25, D. C., plans by Walton & Maddon, 3510 Rhode Island Ave., Mount Rainier, airmens dormitory $1,000,000-$3,000,000; plans by Bernard L. Frishman, 619 Pennsylvania Ave. N. W., Wash., D. C., Nurses BOQ, $100,000-$500,000. CD 8/23.

LATIN AMERICA

Mexico, Ciudad Juarez—HOSPITAL—Sria. de Salubridad Publica, Mexico City, plans 300-bed general hospital. $500,000.

FOREIGN

Germany, Hamburg—REACTOR—Kernenergie Hamburg (Society of Utilization of Nuclear Energy), in Shipbuilding & Navigation, Inc.), Hamburg, plans swimming pool type reactor, Babcock & Wilcox, 161 E. 42 St., New York, N. Y., U. S. A., consult. engrs.

PUBLIC BUILDINGS

▲ **Calif., Huntington Beach**—SCHOOLS—Huntington Beach Union High School Dist., Huntington Beach, voted $3,500,000 bonds, new high school in Westminster, and Huntington Beach High School addns. Neptune & Thomas, 1560 W. Colorado St., Pasadena, archts. CD 4/2.

Calif., Hillsborough—SCHOOL—Hillsborough Elementary School Dist., c/o Supt., 545 Eucalyptus Ave., Burlingame, bond election Mar. 19, addnl. classrooms in 3 schools. $990,000.

Calif., Los Angeles—SCHOOL—Los Angeles Bd. Educ., 1425 S. San Pedro St., plans by Parker & Parker, 408 S. Spring St., replace main bldg. at Toland Way School, 4545 Toland Way. $450,000. CD 4/8/55.

Calif., Oakland—SCHOOL—Oakland City Unified School Dist., c/o Supt., 10252 2nd Ave., plans by Geo. A. Ellingor, 1801 Casterline Rd., and Roland Gibbs, 5359 College St., Allendale elementary school. $575,000. CD 6/8.

Calif., Red Bluff—SCHOOL—Red Bluff Union High School Dist. bond election Jan. 29, school bldgs and expansion program. $660,000.

▲ **Calif., Tiburon**—SCHOOL—Reed Union Elem. School Dist., c/o clerk, voted bonds, elementary school addn. Belaire Belveron Elem. School. $1,023,000.

Conn., Greenwich—HOSPITAL—Town, Town Hall, Nathanel Witherell Hospital addn. $450,000.

Conn., Mansfield—HOSPITAL—State P. Wks. Dpt., 165 Capitol Ave., Hartford, 60 bed hospital bldg. for psychotic mentally retarted children. $475,000.

Ill., Barrington—SCHOOL—Comm. Consolidated School Dist. 4, 616 W. Main St., Barrington, plans by Perkins & Will, 309 W. Jackson Blvd., Chicago, grade school. $439,000.

▲† **D. C., Wash.**—CLASSROOM, etc.—General Services Admin., Public Service Bldgs., plans by William N. Denton, Jr., 1300 Conn. Ave. N.W., classroom and laboratory bldg. at Gallaudet College. $1,887,000. CD 3/28/55.

Fla., Miami—SCHOOL—Dade Co. Bd. Instruction, Admin. Bldg., 275 NW 2 St., plans by Steward Skinner Assocs., 223 SE 1st St., North Miami Beach Junior High School CB-S constr., NE 167 St. to NE 169 St. between 10 and 12 Aves. $850,000. CD 11/3/55.

Ill., Sullivan—SCHOOL—Bd. Educ., Sullivan Community School Dist., Sullivan, voted $995,000 bonds, high school. CD 10/3.

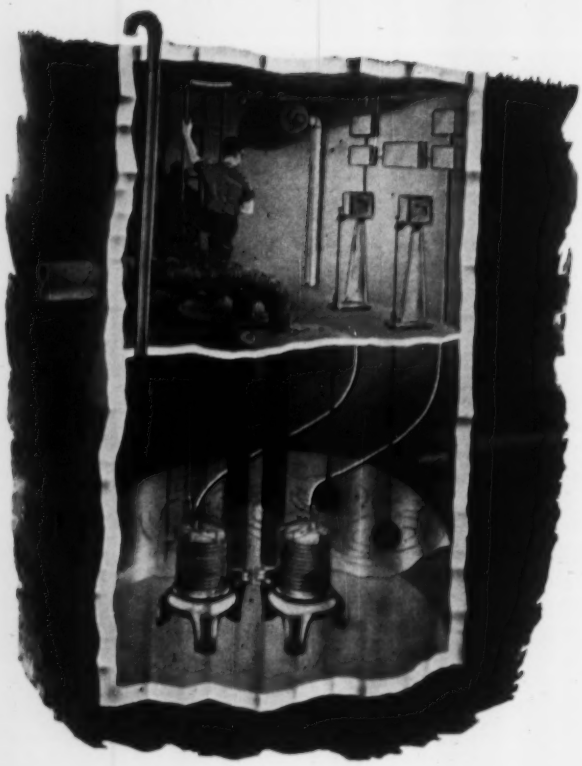
▲ **Ill., Waukegan**—SCHOOL—Waukegan Twp. School Dist. 119, 1011 Washington St., plans by Ganster & Hennighausen, 222 Washington St., high school bldg., west side near Weiss Field. $4,500,000.

Ind., Boonville—GYMNASIUM—Boonville-Boon Twp. Schools, Boonville, plans by Ralph Legeman Assocs., 10 Chestnut St., Evansville, 177x277 ft., masonry, structural steel, concrete gymnasium. $475,000. CD 2/18/53.

Ind., Carmel—SCHOOL, etc.—Carmel School Bldg. Corp., Howard Hunt, pres., R. R. No. 1, plans by Vonnegut,

(Continued on Page 109)

The SUBMERSIBLE SEWAGE EJECTOR



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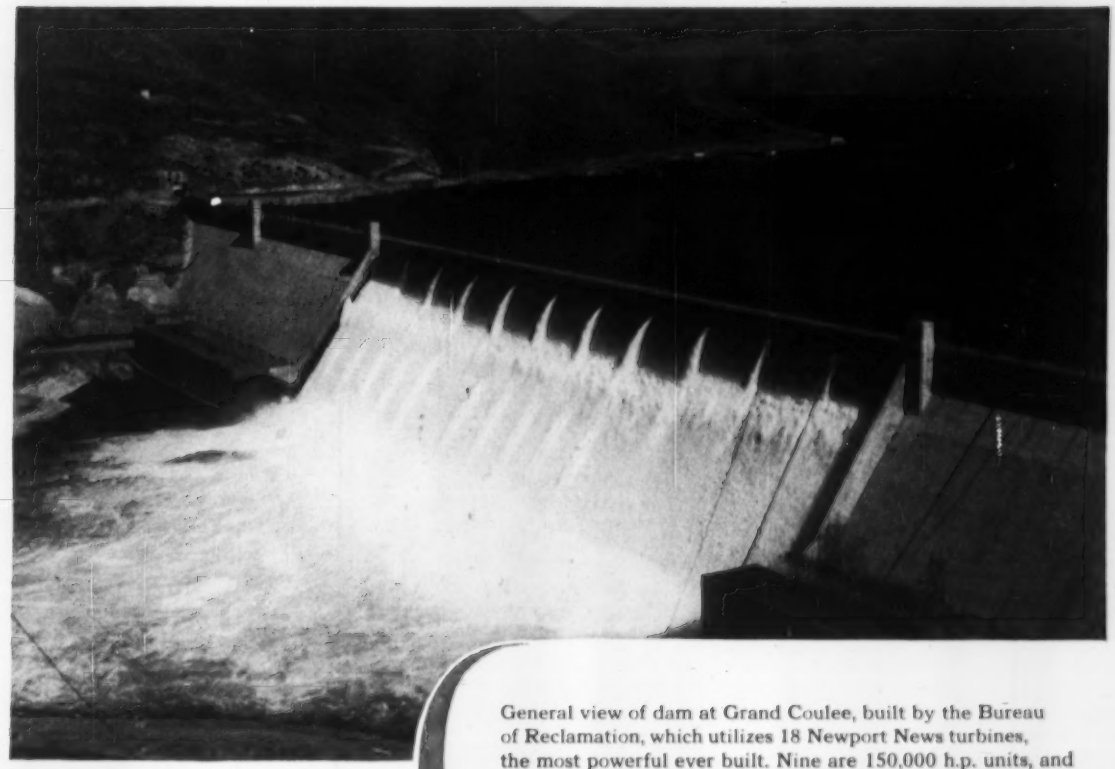

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(Continued from Page 100)

Wright & Porteous, Inc., 1537 Central Ave., Indianapolis, 1 story, masonry, structural steel, concrete school and gymnasium. $900,000. J. M. Rotz Co., 1919 N. Meridian St., Indianapolis, consult. engr. CD 1/11.

Ind., Dyer—SCHOOL—St. John Twp. School Holding Corp., Rt. 1, plans by Turner & Turner, 5945 Hohman Ave., Hammond, 2 story brick high school addn., U. S. Rt. 30. $650,000. CD 10/28/53.

Ind., South Bend—SCHOOL—School City of South Bend, 228 S. St. Joseph St., plans by Chas. Cole & Son, 200 W. La Salle St., 1 story, bsmnt., brick, block, Alex X. Coquillard Elementary School and gymnasium. $625,000.

▲ **Iowa, Iowa City**—SCHOOLS—Bd. Educ., Iowa City, defeated $1,500,000 bonds Oct. 15, Junior High School addn. CD 10/3.

Iowa, Keokuk—SCHOOLS—Independent School Dist., Bd. Directors, Frederic C. Smith, secy., Keokuk, $785,000 bond election Dec. 11; school imprvs. incl. Junior High School addn., North Elementary School, etc. Perkins & Will, 309 W. Jackson Blvd., Chicago, Ill., archts. CD 10/19.

Iowa, Sully—SCHOOL—Lynnville-Sully Consolidated School Dist., Sully, plans by N. Clifford Prall, 346 Insurance Exchange Bldg., Des Moines, high school, $425,000. CD 9/28.

Mass., Amherst—ARMORY—Commonwealth of Mass., University of Mass., c/o Div. Bldg. Constr., 38 Chauncy St., Boston, plans by Clinton F. Woodwin, 25 Washington Sq., Haverhill, U57-2 R.O.T.C. Armory and Classroom Bldg., University of Mass., $400,000; plans by Louis W. Ross, 131 State St., Boston, married students apartments, 108 units, 9 bldgs., $450,000. Constr. 1957.

▲ **Mass., Quincy**—HOSPITAL—City, City Hall, plans by Coletti Bros., 687 Boylston St., Boston, 3 story, 40x140 ft., brick surgical wing, City Hospital, $1,500,000. To go ahead in 1957. CD 2/23/55.

▲ **Mich., Flint**—SCHOOL—Bd. Educ., Beecher School Dist., bond election Dec. 4, 18 room Junior High School. $1,400,000.

▲ **Mich., Hazel Park**—SCHOOL—City, Bd. Educ., 22750 Highland St., $5,500,000 bond election Dec. 12; school program. Jahr Anderson Assoc., 15011 Michigan Ave., Dearborn, archts. CD 6/15.

Mich., Lake Odessa—SCHOOL—Bd. Educ., Community School Dist., plans by Guido-Binda Assoc., 231 Capitol Ave., Battle Creek, elementary school, high school alterations. $460,000.

▲ **Mich., Mount Clemens**—SCHOOLS—Bd. Educ., L'Anse Pub. Schools, 38495 L'Anse Creuse Rd., plans by Eberle M. Smith Assoc., Inc., 153 E. Elizabeth St., Detroit, Zone 1, Junior High School. $900,000; elementary school, $400,000; Green and Atwood Elementary School addns., $400,000. CD 12/16.

Mich., Riverview—MUNICIPAL CENTER—Village, James L. Hale, mgr., $400,000 bond election Dec. 12, municipal center, village hall, recreation bldg., library, garage. CD 5/2.

▲ **Minn., Detroit Lakes**—SCHOOL—Bd. Educ., G. Johnson, supt. schools, voted $950,000 bonds Oct. 16, 2 story high school. $1,000,000. Traynor & Hermanson, St. Cloud, archts. CD 8/16.

Minn., Fairmont—POWER PLANT—City, Water & Light Comn., B. L. Whitney, supt., imprvs. at municipal power plant, furnish, install new turbine, $750,000; furnish, install switchboard, $225,000; bldg. addn., $200,000. W. J. Youngerman, city engr.

Minn., Hastings—SCHOOLS—Bd. Educ., J. P. Zweber, clk., voted $650,000 bonds Oct. 18, two elementary schools. $800,000. Magney, Tusler & Setter, 303 Roanoke Bldg., Minneapolis, archts. CD 10/22.

Minn., Hastings—SCHOOL—Bd. Educ., Indpt. School Dist. No. 26, c/o clerk, plans by Magney, Tusler & Setter, 303 Roanoke Bldg., Minneapolis, 2 elementary schools, $625,000.

Minn., Long Prairie—SCHOOL—Bd. Educ., C. J. Differt, clk., plans by Thorshov & Cerny, 440 Metropolitan Bldg., Minneapolis, high school, $450,000. CD 5/12/54.

Minn., Richfield (P. O. Minneapolis)—SCHOOL—Bd. Educ., H. Rumpel, supt. Schools, election Nov. 15 district will vote on authorizing $690,000 bond issue, completion Junior High School, $390,000; Sheridan Elementary School addn., 6400 Sheridan Ave. S., $300,000. CD 3/8.

Mo., Kennett—SCHOOL—Kennett School Dist. Bd. Educ., elementary school and high school gymnasium. $400,000.

▲ **Mo., Ladue** (St. Louis 24 P. O.)—SCHOOL—Ladue School Dist.; Bd. Educ., Dr. Ivan C. Nicholas, supt. Schools, 1201 S. Warson Rd., Zone 24, plans by Murphy & Mackey, 4746 McPherson Ave., St. Louis, Zone 8, Junior High School. $1,000,000.

Mo., Liberty—SCHOOL—Liberty School Dist. 53, voted $530,000 bonds Oct. 9, school. Marshall & Brown, 1016 Baltimore Bldg., Kansas City, Mo., archts. CD 10/3.

▲† **Mo., St. Louis**—TRAINING CENTER—District Pub. Wks. Office, Ninth Naval Dist., Bldg. 1-A, Great Lakes, Ill., Naval and Marine Corps Training Center on 3 or 4 acres sites. $1,500,000.

Mo., Warrensburg—DORMITORY—Central Missouri State College, Warrensburg, plans by Everitt & Keleti, 4550 Main St., Kansas City, Mo., 4 story, rein-con., brick mens dormitory. $450,000.

N. J., Franklin Twp. (Middlebush P.O.)—APARTMENT—Franklin Twp. Housing Auth., Town Hall, Middlebush, plans by Boykin & Moss, 75 Paterson St., New Bruns-

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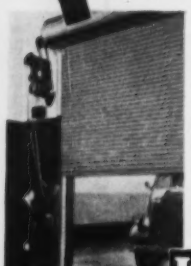

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wick, 50 unit apartment type houses between Somerset and Hamilton Sts. near Millstone Rd. $750,000.

▲ N. M., Hobbs—COURT HOUSE—Lea Co., Hobbs, voted $1,200,000 bonds Sept. 18, 40,000 sq. ft. masonry court house.

N. Y., Brooklyn—FIRE HOUSE—Dpt. P. Wks., Municipal Bldg., plans by Albert B. Bauer, c/o owner, 2 story fire engine house, 151 Neptune Ave. $300,000. CD 3/7/55.

N. Y., Central Square—SCHOOL—Central Square Dist., voted $600,000 bonds Oct. 2, elementary school. $420,000. CD 9/14.

N. Y., Hauppauge—DETENTION HOME—Bd. Supervs. Suffolk Co., Riverhead, detention house for juvenile delinquents and children's court on tract on Veterans Memorial Hy. $350,000.

N. Y., New Rochelle—CITY HALL, etc.—City, City Hall, plans by William Whitehill, 277 North Ave., New Rochelle, alterations, addn. to city hall and police station. $400,000.

▲ O., Cleveland—SCHOOL—Bd. Educ., 1380 E. 6th St., elementary school between E. 91 and E. 92 Sts., north of Wade Park Ave. $1,300,000. (Correction—location). CD 10/15, under Mo., Cleveland.

▲ Okla., Bartlesville—SCHOOL—Bd. Educ., Bartlesville, voted bonds Oct. 16, school. $1,200,000. CD 9/5.

▲ Okla., Enid—SCHOOL—Bd. Educ., Enid, bond election Nov. 20, Junior High School. $1,650,000. D. A. Smith, Enid, archt.

S. C., Spartanburg—CITY HALL-JAIL—City, city hall and jail. $887,337.

▲ Tex., Brownsville—POWER PLANT—City, voted bonds Oct. 13, power plant, $3,150,000. CD 9/26.

Tex., Houston—SCHOOL—Houston Independent School Dist., 1300 Capitol St., plans by Wirtz, Calhoun, Tungate & Jackson, 2516 Richton St., convert old San Jacinto High School into vocational and technical school bldg. $400,000.

Tex., McAllen—AUDITORIUM—City, City Hall, plans by Zeb Rike, 308 S. Main St., and Edwin Byers, 1308 Chicago St., auditorium. $500,000. W. E. Simpson Co., 945 Milam Bldg., San Antonio, Tex., Vernor & Callins, Taft, Tex., and Bolt, Beranek & Newman, Inc., 16 Eliot St., Cambridge, Mass., consult. engrs. CD 3/8.

▲ Tex., Midland—SCHOOLS—Midland Independent School Dist., Midland, cancelled bond election Oct. 12, administration bldg., $600,000; high school unit in Cuthbert area, $525,250; elementary school, west end of Cuthbert St. $400,000; elementary school in east Front Addn. $475,000. Preston M. Geren, 1607 Fort Worth Natl. Bank Bldg., Fort Worth, archt. CD 9/25.

Wash., Edmonds—SCHOOL—School Bd., Edmonds, plans by D. Miller, Edmonds, Perrinville Elementary School. $501,167. Bids next month. CD 6/25.

Ont., St. Thomas—SCHOOL—Central Elgin Dist. High School Bd., c/o Arthur Voaden, Vocational School, plans by J. Fred Green, 544 Talbot St., high school expansion Voaden Vocational School, 6 shops and five classrooms and gymnasium. $450,000. CD 2/14.

Ont., Simcoe—SCHOOL, etc.—Simcoe Dist. High School Bd., Simcoe, school auto and electric shop. $650,000. D. N. McIntosh, C. Moeller, W. Smale Assoc., 55 Colborne St. S., archts-engrs. CD 9/20/49.

COMMERCIAL BUILDINGS

Ark., Texarkana—HOSPITAL REMODELING, etc. St. Louis Southwestern Railway Lines Hospital Trust, Dr. Wm. Hibgitts, ch. Surgeon, St. Louis Southwestern Hospital, Texarkana, plans by Page, Southerlan & Pate, 602 West Ave., Austin, Tex., hospital remodeling and imprvs., $500,000. CD 8/17, under Cotton Belt Hospital as owner.

Calif., Los Angeles—MOTEL—KLW Corp., c/o John J. Kewell, archt., 1344 Wilshire Blvd., motel, 2 story, subterranean, rein.-con. garage, 69 frame, stucco units, 26,000 sq. ft.; garage, 25,000 sq. ft., air-conditioned, swimming pool, $500,000.

▲ Calif., Sebastopol—SHOPPING CENTER—Mr. Henry C. Gaul, 172 Pleasant Hill Rd., shopping center along Gravenstein Hy. North of shops, to consist offices, restaurant, swimming pool, tennis courts, cocktail lounge and medical bldg. $1,000,000.

▲ Colo., Denver—DORMITORY—University of Denver, Campus, Denver, dormitory for 400 students, E. Iliff Ave. and S. High St. $2,000,000.

▲ Conn., Branford—APARTMENT—Sachs Bros., Cherry Hill Rd., 420-apartment project, Post Rd., Branford Hill, $2,000,000.

Conn., Windsor—HOUSES—George W. Fosberg, 2 Garden St., Wilson, 30 house development, East View Heights, Foquonock Ave. $594,000.

D. C., Wash.—CHURCH—Gethesemane Baptist Church, 3830 Georgia Ave. N.W., plans by R. C. Archer, Jr., 215 Florida Ave. N.W., 2 story, brick, cinder block church, 3816 Georgia Ave. N.W., $400,000.

D. C., Wash.—HOUSES—A. L. Wheeler, Sheraton Bldg., plans by Walter Marlowe, 3200 "P" St. N. W., 17 houses, P. St. N.W., 30th St. 31st and Q Sts. to be known as Dumbarton Rock Court. $850,000.

Fla., Orlando—SHOPPING CENTER—Food Fair Stores, Inc., 3400 N. W. 71 St., Miami, shopping center, Azalea Park, $500,000.

▲ Ill., Chicago—RESEARCH PAVILION—Michael Reese Hospital, 29th St. and Ellis Ave., plans by Loebl, Schlossman & Bennett, 430 N. Michigan Ave., 6 story, brick, steel, concrete Ruth Cummings Research Pavilion, 2912-18 S. Ellis Ave. $1,200,000.

Ill., Chicago—SHOPPING CENTER—Belden Shopping Center, c/o Hirschfeld & Pawlan, archts., 327 S. LaSalle St., 7 unit shopping center, N. Clark St. and Belden Ave. $500,000.

▲ Ind., Crawfordsville—LIBRARY, etc.—Wabash College, Crawfordsville, library, $1,000,000; converting Landes Library Hall into speech-music bldg. and constr. 2 new dormitories, $4,000,000.

▲ Ind., Culver—AUDITORIUM-THEATER—Culver Military Academy, Culver, plans by William B. Ittner Inc., 911 Locust St., St. Louis, Mo., Gene Eppley Auditorium-Theater for the academy, $1,400,000. CD 8/13/54.

Ind., South Bend—APARTMENT—Cornelius Pitt (agent), 39 S. LaSalle St., Chicago, Ill., plans by John N. Marx, 4814 N. Damen Ave., Chicago, Ill., 4 story, 60 unit, brick, concrete block apartment, 20th and Northside Blvd. $600,000.

Ky., Louisville—NURSES HOME—Norton Memorial Infirmary, Third and Oak Sts., plans by Thos. J. Nolan & Sons, 311 Kentucky Home Life Bldg., Fifth and Jefferson Sts., nurses home addn. $400,000. To go ahead in January.

▲ Ky., Louisville—HOSPITAL—Our Lady of Peace Hospital, Newburg Rd., plans by Thomas J. Nolan & Sons, Ky. Home Life Bldg., S and Jefferson Sts., Louisville, hospital addn. $1,000,000. (Correction-name of architect). CD 10/24.

▲ La., New Orleans—SHOPPING CENTER—Gulf Coast Oil Co., 3331 St. Charles Ave., 50,000 sq. ft. shopping center. $1,000,000. Patrick M. Allison & Assn., 315 St. Charles St., consult. engrs.

▲ Mass., Boston—OFFICE—Prudential Insurance Co. of America, 763 Broad St., Newark, N. J., plans by Cram & Ferguson, 248 Boylston St., regional home office, Back Bay Section, $3,000,000, Metcalf & Eddy, 1300 Statler Bldg., engrs. CD 5/27/53.

Mass., Lowell—SCHOOL—St. Patrick's R. C. Parish, Lowell, parish School, $400,000. Constr. in 1957.

▲ Mass., Quincy—Faxon Trust, Robert M. Faxon, 1245 Hancock St., 2½ story revenue accounting bldg., 159-175 Upland Rd. $1,000,000, New England Telephone & Telegraph Co., 185 Franklin St., Boston, Mass., lessee.

Mich., Royal Oak—HEADQUARTERS—Florists Telegraph Delivery Assoc., Lafayette Bldg., Detroit, national headquarters bldg., Woodward Ave. between Hendrie and Lincoln, $500,000.

N. J., Madison—AUDITORIUM, etc.—Drew University, Madison Ave., plans by Alfred Hopkins, 292 Madison Ave., New York, N. Y., auditorium gymnasium, aud. to seat 1,500, gym, 1,200, incl. natatorium. $900,000.

▲ N. Y., Buffalo—HOUSING—J. P. Straubinger Constr. Co., 229 French St., plans by Donald W. Love, 232 Delaware Ave., housing development, $1,800,000.

N. Y., Buffalo—LIBRARY—Canisius College, Main and Jefferson Sts., 3 story library, $750,000. To go ahead in the Spring.

▲ N. Y., Cheektowaga—HOSPITAL—St. Joseph Intercommunity Hospital, Cheektowaga, hospital, $1,700,000.

▲ N. Y., Greenburgh—OFFICE, etc.—New York Telephone Co., 140 W. St., 2 story office and exchange bldg., County Center Rd. $1,500,000.

▲ N. Y., New York—OFFICE—Joseph P. Blitz, Inc., 1 E. 57 St., Zone 22, plans by Emery Roth & Sons, 575 Madison Ave., New York, Zone 22, 22 story office, Fourth Ave. and 32 St. $3,000,000. CD 2/29.

▲ O., Amberly Village—HOUSES—Kopf & Kopf, Inc., 825 Delta Ave., Cincinnati, 45 1-fl., brick, bsmnt. homes, off Galbraith and Ridge Rd. $1,800,000. Ed. Niemeier, 3818 North Bend Rd., Cincinnati, consult. engr.

O., Beachwood—HOME FOR AGED—First Catholic Ladies Slovak Union, 3756 Lee Rd., Cleveland, Zone 28, Home for Aged, Kinsman and Richmond Rds. $500,000.

O., Bedford Heights—CLUBHOUSE, etc.—Terrace County Club, 4218 Lee Rd., Cleveland, Zone 28, plans by Keller Constr. Co., 4218 Lee Rd., Cleveland, Zone 28, 2 story, brick, frame club house, swimming club, 9 hole illuminated golf course, $400,000.

O., Cleveland—CHURCH—Catholic Diocese of Cleveland, 1027 Superior Ave., plans by J. Ellsworth Potter, Schofield Bldg., St. Mary's Catholic Church, 156th and Holmes Ave. $450,000.

▲ O., Lordstown—SHOPPING CENTER—Victor V. Van Cantfort, 3502 Norwood St., Cleveland, shopping center with 30-40 stores; 20-unit or more apartment house. $3,500,000. Bids early 1957.

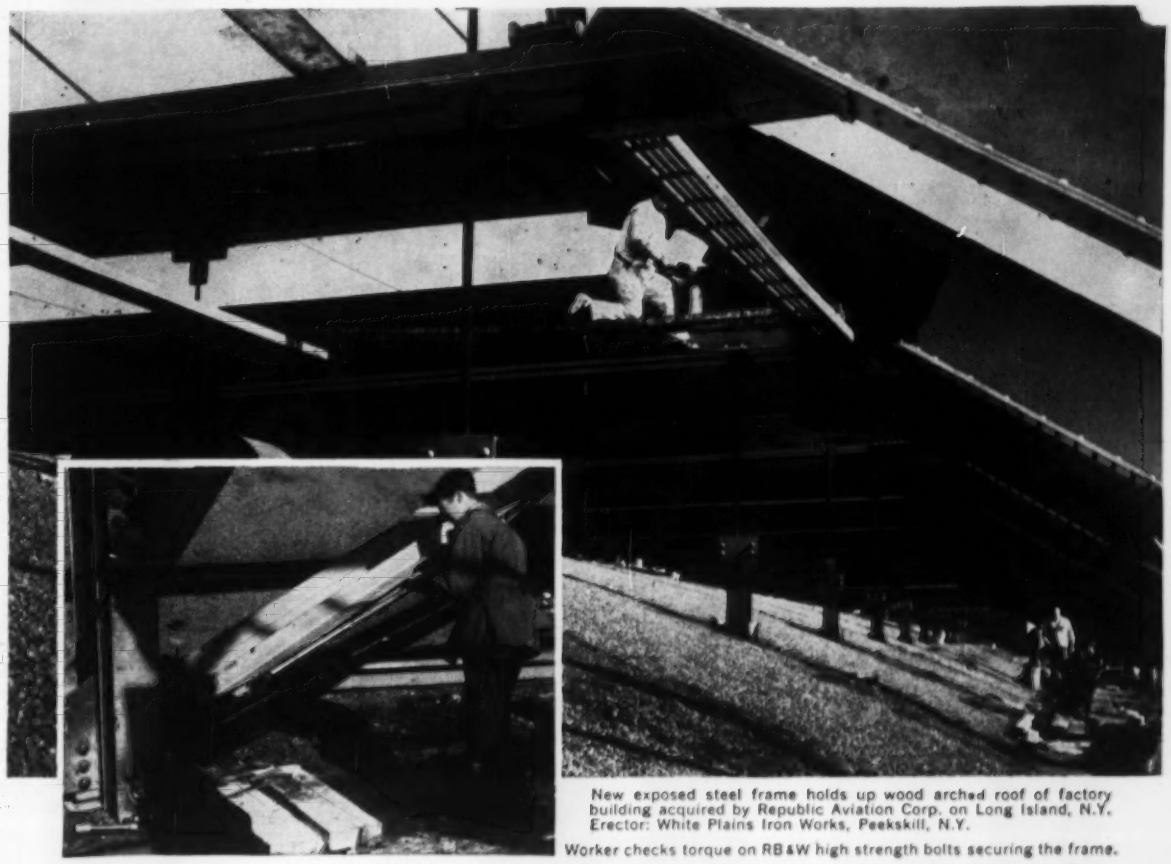
▲ O., Sylvania—HOMES—Howard Crosby, 717 Madison Ave., Toledo, 41 homes south of Sylvania Ave. and West Holland Sylvania Rd. $1,600,000.

O., Westlake—CHURCH—Westlake Christian Church, Harold G. Fitch, Bldg. chn., Union Commerce Bldg., plans by Travis G. Walsch & Assoc., 2123 E. 9th St., church, $500,000.

▲ Pa., Southampton—RESIDENTIAL DEVELOPMENT, etc.—Henry E. Schwartz, 8032 York Rd., Elkins Park, residential development (300) and shopping center, $10,000,000.

▲ Tenn., Memphis—APARTMENT—Bloomfield & Stone Co., c/o Robert H. McCarty, archt., Falls Bldg., luxury co-operative apartment, Union near East Parkway, and 11 story, 90x150 ft. bldg. with 120 apart-

(Continued on Page 112)



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(Continued from page 110)

ments to range from 1,000 sq. ft. in size up to 4,000. $5,000,000.

▲ **Tex., Dallas**—COLLEGE—Baptist Church, c/o Rev. Bert Mattingley, East Dallas Baptist Church, 415 Fitzhugh, constr. Junior College. $3,000,000.

▲ **Tex., Dallas**—DWELLINGS—Centex Constr. Co., 4606 Greenville St., 28 dwellings, $347,700; 36 dwellings, $361,000; 31 dwellings, $365,200; 33 dwellings, $373,925; 30 dwellings, $356,110; 38 dwellings, $381,000, in miscellaneous areas.

▲ **Tex., Houston**—EDUCATION, etc.—Baptist General Convention of Texas, c/o Executive Board, Baptist Bldg., Dallas, constr. Baptist co-educational, Liberal Arts College Bldg., 100-acre campus. $1,500,000.

▲ **Tex., Houston**—DWELLINGS—R. V. King Contr., 12202 Hempstead St., 34 dwellings, $355,000; 36 dwellings, $366,195; 38 dwellings, $378,110; 41 dwellings, $405,000, Lang Forest.

▲ **Tex., Houston**—DWELLINGS—Raleigh A. Smith & Son, Inc., 5710 Airline St., 28 dwellings, $365,190; 21 dwellings, $345,500; 26 dwellings, $351,000; 30 dwellings, $377,410; 24 dwellings, $361,000, in "Hidden Valley".

▲ **Tex., San Antonio**—DWELLINGS—H. B. Zachry Properties, Inc., 310 S. St. Marys St., 22 dwellings, $359,000; 18 dwellings, $347,500; 26 dwellings, $371,100 in "Northwood".

▲ **Wash., Kenmore**—SEMINARY—Catholic Archdiocese of Seattle, 907 Terry St., Seattle, 4 story seminary, $3,000,000.

▲ **Newfoundland, St. John's**—ARTS, etc.—Memorial University of St. Johns', St. John's, plans by Durnford, Bolton, Chradwick & Ellwood, 1980 Sherbrooke St. W. and Lawson & Betts, 660 St. Catherine St. W., both Montreal, and A. J. C. Paine, consult.-archt., Sun Life Bldg., Montreal, (1) 3 story, bsmnt., arts and administration bldg. (2) 3 and partly 4 story, bsmnt. science and engineering bldgs., incl. 34 laboratories, (3) 2 story, bsmnt., library; (4) 2 story bsmnt. gymnasium with swimming pool, Elizabeth Ave., 120 acres, Over $2,000,000. CD 12/7/44.

▲ **Ont., Toronto**—COMMUNITY—Consolidated Building Corp., 89 Avenue Rd., will not construct Satellite Community on 400-acre tract, Scarborough, $30,000,000. Project rejected by Township Council. CD 9/18.

Ont., Toronto—ANCILLARY, etc.—Hospital for Sick Children, 555 University Ave., plans by Govan, Ferguson, Lindsay, Kaminker, Langley & Keenleyside, 10 Price St., 2 story ancillary bldg. and nurses' residence, University Ave., Gerrard St. W., Chestnut and Elm Sts. $500,000.

▲ **Que., Montreal**—APARTMENT, etc.—Henry & William Le Radza, 4803 Mira Rd., 14 story, 3 bsmnt. levels, rein.-con. apartment and hotel underground parking in two levels for 35 cars, aluminum curtain walls, stone finishing tar and gravel roof, Sherbrooke St. W. and Peel St. $1,500,000. Pierre M. D'Allemagne, 3180 Van Horne St., consult. engr. CD 6/16/55.

▲ **Que., Quebec City**—STORE—La Compagnie Paquet Ltee, 157 St. Joseph St., 6 story department store addns., alterations, St. Joseph St., on Charest Blvd. on next street. $2,500,000-$3,000,000

INDUSTRIAL BUILDINGS

▲ **Calif., San Leandro**—FACTORY, etc.—Anchor Hocking Glass Corp., 109 N. Broad St., Lancaster, O., glass container factory and warehouse. $3,750,000.

▲ **Calif., San Leandro** — TERMINAL — Consolidated Freightways Inc., 431 Burgess Dr., Menlo Park, trucking terminal on 30 acre site on Doolittle next to Western Electric Co. $1,000,000.

▲ **Colo., Silt**—MILL—J. & J. Rogers Co., Ausable Forks, N. Y., newsprint mill. $10,000,000. Alvin H. Johnson & Co., 415 Lexington Ave., New York, Zone 17, N. Y., consult. engrs. Paper machine awarded to Black-Clawson Co., Vine and 2 Sts., Hamilton, Ohio. CD 4/23.

Conn., Meriden—FACTORY—Hinde & Dauch Paper Co. (Sub. West Virginia Pulp & Paper Co.), 407 Decatur St., Sandusky, O., 1 story, 87,000 sq. ft. corrugated box factory. $800,000. Gibbs & Hill, Penn Station, New York, N. Y., consult. engrs.

▲ **Ill., Chicago**—LABORATORY OFFICE—International Minerals & Chemical Corp., 20 N. Wacker Dr., Chicago, plans by Perkins & Will, 309 W. Jackson Blvd., Chicago, research laboratory office bldg. $3,500,000.

Ill., Cicero—WAREHOUSE—Cities Service Oil Co., Cities Service Oil Bldg., Bartlesville, Okla., plans by Collins, Inc., 1026 McGee St., Kansas City, Mo., 80,000 sq. ft. warehouse. $700,000. CD 4/5.

Ind., Noblesville—PLANT—Firestone Tire & Rubber Co., 1200 Firestone Parkway, Akron 17, O., 1 story plant to produce rubber air springs, $500,000.

▲ **Mich., Clawson**—FACTORY—Sherman Products, Inc., 3200 W. 14-Mile Rd., Royal Oak, factory, Crooks and Elmwood Sts. $1,500,000.

Mich., Detroit—WAREHOUSE—General Tire & Rubber Co., 1708 Englewood St., Akron, O., 1 story, steel, brick warehouse and office, air-conditioned, $650,000.

▲ **Mont., Missoula**—MILL—Waldorf Paper Products Co., 2250 Wabash St., St. Paul, Minn., 250 ton per day pulp mill, $6,000,000.

▲ **N. J., Newark**—PLANT—Kolker Chemical Corp., 600 Doremus Ave., plant, Wilson Ave. and Ave. D on 21 acre "old city dump", to make chemical center. $1,000,000

▲ **N. J., Newark**—GARAGE—Mutual Benefit Life Ins. Co., 300 Broadway, plans by Frank Grad & Sons, 11 Commerce St., 3 deck garage, Atlantic St., Bridge St., Lombardy St. and McCarter Highway two upper decks, ground floor of glazed tile and aluminum grillwork, rein.-con., to accommodate 1,100 cars. $1,500,000.

▲ **N. Y., Travis**—GENERATING STATION—Consolidated Edison Co., 4 Irving Place, New York, Zone 3, Arthur Kills Generating Station, foot of Victory Blvd. $40,000,000.

Ore., Portland—WAREHOUSE—General Tire & Rubber Co., 1708 Engelwood St., Akron, 1 story, brick, steel warehouse, $500,000. To go ahead Spring 1957.

▲ **Tex., Baytown**—PLANT—Humble Oil & Refining Co., Baytown, benzine mfg. plant. $5,000,000.

▲ **Wash., Seattle**—WAREHOUSE—Parr-Richmond Industrial Corp., 1 Drumm St., San Francisco, Calif., 50,000 sq. ft. warehouse. $4,750,000. Work to start this year. Boeing Airplane Co., lessee.

▲ **Wash., Ferndale**—REFINERY EXPANSION—General Petroleum Corp., Ferndale, oil refinery expansion, $7,000,000. Work to start in 1958.

▲ **Que., Cap de la Madeleine**—FACTORY, etc.—Continental Paper Products, Ltd., 700 rue Notre Dame, Cap de la Madeleine factory and office, rue St. Maurice. $2,000,000.

UNCLASSIFIED

Illinois—TELEPHONE LINES—Inland Telephone Co., Max G. Hoagland, mgr., Champaign, rural telephone lines system, Champaign Co. $687,000. Sloan, Cook & Lowe, 120 S. LaSalle St., Chicago, consult. engrs. CD 10/1.

▲ **Louisiana**—GAS PIPE LINES, etc.—Southern Natural Gas Co., Watts Bldg., Birmingham, Ala., 27 mi. gas pipe lines in fields of LaFourche Parish, $1,200,000; constr. compressor units in LaFourche Parish, $1,500,000.

Tex., Brownsville—POWER LINES—City, voted bonds Oct. 13, power lines, $700,000. CD 9/26.

▲ **Va., Norfolk**—PORT CONSTRUCTION—Norfolk Port Auth., Bd. of Trade Bldg., plans by Hayes, Seay, Mattern & Mattern, archts.-engrs., Bousn St. and Olney Rd., 500,000 sq. ft. warehouse, multi-story office, pier space for 4 ships, covered dock and wharfs. $12,740,000.

Wash., Kalama—HATCHERY—State Dpt. Fisheries, Olympia, hatchery on Kalam River with hatchery bldg. and 18 rearing ponds, $375,000.

Wis., Lake Geneva—PARK—Natls. Parks Corp., c/o Milwaukee Bonding Co., 826 W. State St., Milwaukee, "Fantasyland" Park, bldgs., motel, water and sewer, 1,000 car parking lot, $800,000. O. Neil Olson, 2435 N. 84th St., Milwaukee, consult. engr.

Wis., Madison—PARKING—Dane Co., Madison, parking structure. $750,000-$800,000. Mead & Hunt, Inc., 2320 University Ave., consult. engr.

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Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

HEAVY CONSTRUCTION—BA

Mass., East Boston—AUTO PARKING AREAS—BA 11/20—Commonwealth of Mass., Airport Management Bd., Div. Bldg. Constr., 38 Chauncy St., Boston, L-801 Contr. 2, constr. paving auto parking areas, aprons, holding station and fillets, Logan Airport, $490,000. Plans deposit $40, refundable. Thompson & Lichtner Co., Inc., 8 Alton Place, Brookline, engr. CD 2/21.

† **Mass., Chicopee Falls**—RECREATIONAL GYMNASIUM, GENERATOR SHELTER—BA On Or About 11/21—U. S. Eng., 150 Causeway St., Boston, Zone 14, 1 story, 50x185 ft. recreational gymnasium; 1 story, 15x27 ft. generator shelter, addn. to existing Base Hangar No. 1, Westover Air Force Base, ENG-19-016-57-84. Est. $200,000-$300,000. Plans deposit $10.

Mass., Boston—ELECTRICAL DISTRIBUTION SYSTEM—BA 11/21—State, Div. Bldg. Constr., 38 Chauncy St., Boston, G-302 Contr. 3, electrical distr. sys., State Hospital, Bulfinch Bldg. $163,300. Plans deposit $20, refundable. McCarron & Sullivan, Inc., 45 Newbury St., Boston, engr. CD 2/14.

BUILDINGS—SLC

Conn., Hamden—PLANT—Columbia Printing Co., 174 Commerce St., New Haven, soon lets contract brick printing plant, Welton St. $200,000. Chas. H. Abramowitz, 52 Goffe Terrace, New Haven, archt. CD 10/10.

HEAVY CONSTRUCTION—LB & CA

† **Wexler Constr. Co.**, 118 Needham St., Newton Highlands, Mass. LB $671,000, est. $600,000-$700,000. airmen's dormitories, Dow Air Force Base, ENG-19-016-57-49, BANGOR, ME. U. S. Eng., 150 Causeway St., Boston, Mass. Crowell, Lancaster & Higgins-Pederson & Tilney, 6 State St., Bangor, Me., archts. Bids Oct. 23. CD 10/4.

† **Consolidated Constr., Inc.**, 807 Congress St., Portland, Me. LB $94,200, est. $50,000-$100,000. recreational facilities, multi-purpose Air Force Station, ENG-19-016-57-75, CARIBOU, ME. U. S. Eng., 150 Causeway St., Boston, Mass. Bids Oct. 25. CD 10/4.

† **District P. Wks., Office, First Naval Dist.**, 495 Summer St., Boston, Mass., cancelled bids to have been opened Oct. 4, relocating transmitting facilities, Bass Harbor to Prospect Harbor, ME By 6805, Spec. 6805/56. WINTER HARBOR, ME. Will re-advertise. CD 9/20.

Tornabene Bros. Co., 170 Needham St., Newton Upper Falls, Mass. CA $675,495, est. $751,000. bathhouse, swimming pool, 70 Tappan St., BROOKLINE, MASS. Town Bldg. Comn., John M. Hall, chn. Bd. Selectmen, Town Hall, Brookline, Mass. CD 10/12, under LB.

▲† **U. S. Eng.**, 150 Causeway St., Boston, Mass. cancelled bids to have been opened Oct. 16, addnl. storage facilities, Otis Air Force Base, ENG-19-016-57-65, FALMOUTH, MASS. $1,500,000-$1,750,000. Black & Veatch, Engineers, Woods Chapel Rd., Independence, Mo., engrs. CD 9/26.

Ralph Richard Co., 495 Whiting Ave., Dedham, Mass. LB $167,845, est. $173,000. sewers, HINGHAM, MASS. Town, Bd. Sewer Comrs., Town Office Bldg., 14 Main St., Hingham, Mass. Bids Oct. 24.

S. J. Virgilio Constr. Co., Inc., 10 Nashua St., Worcester, Mass. LB $84,042, est. $85,000. public streets, various locations, WORCESTER, MASS. City, Dpt. P. Wks., 20 E. Worcester St., Worcester, Mass.

BUILDINGS—LB & CA

▲ **Brook Realty, Inc.**, 180 Lincoln St., Boston, Mass. Owner Builds. $1,000,000. mechanical off-street parking, 27-47 Providence St., BOSTON, MASS. Brook Realty, Inc., 180 Lincoln St., Boston, Mass. Bids Oct. 15. CD 10/9.

▲ **Vappi & Co., Inc.**, 240 Sidney St., Cambridge, Mass. CA Approx. $1,200,000. MANUFACTURING BLDG. addn., Sylvan St., DANVERS, MASS. Sylvania Electric Products, Inc., C. A. Haines, dir. Facility Planning, 460 Market St., Williamsport, Pa. Bids Oct. 9. CD 9/26.

Seltzer & Co., Inc., 125 Harvard Ave., Allston, Mass. LB $177,547. M-817, POWER PLANT imprvs., State Hospital, GRAFTON, MASS. State, Dpt. Mental Health, Div. Bldg. Constr., 38 Chauncy St., Boston, Mass. Bids Oct. 26. CD 10/9.

▲ **Park Constr. Co., Inc.**, 40 Court St., Boston, Mass. CA $1,904,450, est. $1,900,000. M-716 ADMISSION-TREATMENT BLDG., State Hospital, MEDFIELD, MASS. State, Dpt. Mental Health, Div. Bldg. Constr., 38 Chauncy St., Boston, Mass. CD 10/9, under LB.

Hadley Constr. Co., Inc., 215 Salem St., Medford, Mass. LB $675,924. WOMEN'S DORMITORY, MEDFORD, MASS. Tuffts University, Bouve Boston School, Medford, Mass. Bids Oct. 25. CD 10/12.

Aquadro & Cerruti, Inc., Texas Rd., Northampton, Mass. LB $789,833. DORMITORY, NORTHAMPTON, MASS. Clarke School for the Deaf, 46 Round Hill St., Northampton, Mass. Bids Oct. 26. CD 10/10.

▲ **George L. Hickey, Inc.**, 13 Spring St., Stamford, Conn., CA $2,184,890 (8 bidders) Catholic HIGH SCHOOL and CONVENT, Newfield Ave. between Case and Vine Rds., STAMFORD, CONN. Diocese of Bridgeport, Chancery Office, 395 Washington Ave., Bridgeport, Conn. Bids Oct. 2. CD 9/25.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

Pa., Phila.—BA 11/15—Procurement Dpt., City Hall Annex, alteration and addition to existing scale house, Harrowgate Incinerator, "G" St. and Ramona Ave. CD 2/4/44.

N. Y., Brooklyn—EQUIPMENT—BA 11/16—New York City Transit Auth., 370 Jay St., Brooklyn, Zone 1, furnishing, installing equip. for service rooms and mezzanine of the DeKalb Ave., reconstr., Contr. E-154.

HEAVY CONSTRUCTION—LB & CA

▲ **Slattery Contg. Corp.**, 46-36 54 Rd., Maspeth, N. Y. CA $4,748,389. (2 bidders) Manhattan Plaza imprvs., Brooklyn Bridge reconstr. of bridge approach alterations to subway structures in connection with wid'n. Centre St. and Park Row and constr. pedestrain underpass, ramps, approaches, paving and landscaping, NEW YORK, N. Y. Dpt. P. Wks., Municipal Bldg., New York 7, N. Y. CD 9/26, under LB.

John Matricciani, Inc., 408 S. Caroline St., Baltimore 31, Md. LB $162,082. Items 7, 8, 9 and 10. Contr. 524 D.S.&W. group bids, TOWSON, MD. Comrs. Baltimore Co., County Office Bldg., Towson, Md. Bids Oct. 19, CD 10/5;

Piccirilli Constr. Co., 3114 Mareco Ave., Baltimore 13, Md. LB $64,958. Items 4, 5 and 6 (Towson, Md.).

Vanguard Constr. Corp., 369 Lexington Ave., New York, N. Y. CA power pumping station exten., outdoor facilities to pump 60,000 g.p.m. Fairless Hills, MORRISVILLE, PA. U. S. Steel Corp., William Penn Pl., Pittsburgh, Pa. Bids July 3. CD 7/6.

BUILDINGS—LB & CA

▲ **Pasty & Fuhrman, Inc.**, 369 Lexington Ave., New York 17, N. Y. LB $4,579,000. (5 bidders) general constr. BRONX HIGH SCHOOL OF SCIENCE, West 205 St. and Goulden Ave., the Bronx, NEW YORK, N. Y. Bureau Constr., 42-15 Crescent St., Long Island City 1, N. Y. Bids Oct. 23, CD 9/12;

Astrove Plumbing & Heating Corp., 36-14 32 St., Long Island City, N. Y. LB $546,000. (7 bidders) plumbing work (New York, N. Y.);

H. Sand & Co., Inc., 11 Park Place, New York 7, N. Y. LB $702,675. (5 bidders) heating work (New York, N. Y.);

Rao Electrical Equipment Co., Inc., 314 E. 39 St., New York 16, N. Y. LB $1,076,000. (10 bidders) electric work. (New York, N. Y.).

▲ **Colmar Constr. Co.**, 364 Gold St., Brooklyn 1, N. Y. CA $1,721,000. general constr. PUBLIC SCHOOL 138 Pugsley and Olmstead Aves., Bronx Boro, NEW YORK, N. Y. Bd. Educ. Bureau Constr., 42-15 Crescent St., Long Island City 1, N. Y. CD 10/18, under LB.

(Continued on page 116)

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(Continued from page 114)

▲ **Michael Perrutkas**, 95 Crooks Ave., Clifton, N. J., Owner Builds, $3,300,000. 165 HOMES on tract on Passaic Ave., CLIFTON, N. J.

▲ **Falcom Homes, Inc.**, 12-39 Saddle River Rd., Fair Lawn, N. J., Owner Builds, $1,250,000. 50 HOMES, Meadowcroft Colony section, off Route 46, FAIR LAWN, N. J. C. J. Kordys, 116 Passaic St., Passaic, archt.

▲ **F. D. Rich & Co.**, 550 Summer St., Stamford, Conn., LB $1,555,000. (9 bidders) construct and finance, 120-units of Capehart HOUSING, ENG-30-075-57-1, FORT MONMOUTH, N. J. U. S. Eng., 111 E. 16 St., New York 3, N. Y. Bids Oct. 25. CD 9/28.

▲ **Canterbury Estates, Inc.**, 630 Mountain Dr., South Orange, N. J., Owner Builds. $1,400,000. 97 HOMES, Hamilton Square between Trenton and Princeton at Landers Dr., HAMILTON TWP., N. J. William Chirgotis, 968 Stuyvesant Ave., Union, N. J., archt.

▲ **John Arnold**, c/o Geo. H. Beckman, Inc., Highway No. 4, Teaneck, N. J. Owner Builds. $3,000,000. 110 HOMES, Fardlae Section of Mahwah off Wyckoff Ave., MAHWAH, N. J.

▲ **Fred Rudinger**, 30-97 Steinway St., Long Island City, N. Y., Owner Builds. $3,000,000. SHOPPING CENTER, PERTH AMBOY, N. J. Morris Brody, 560 Saddle Ridge Rd., Woodmere, N. Y., archt.

Wark & Co., 1920 Sansom St., Phila., Pa., CA $7,500,000. 1 story, 200x360 ft., brick, concrete block & t.-g. PLANT, PHILA., PA. The Budd Co., 2450 Hunting Park Ave., Phila., Pa. Giffels & Vallet, Inc., 243 W. Congress St., Detroit, Mich., engr. CD 8/12/53.

SOUTH

HEAVY CONSTRUCTION—BA

▲† **Ky., Louisville**—FACILITIES—BA 11/20—U. S. Eng., 830 W. Broadway, hangar, boiler house, supply and armament storage bldg., motor service shop, Air National Guard Facilities at Standiford Field, ENG-15-029-57-23, Extended date, Arrasmith & Tyler, Madrid Bldg., archts. CD 10/16.

† **N. C., Weeksville**—COLD STORAGE BLDG.—BA 11/27—Dist. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk 11, Va., cold storage bldg., Naval Air Facility, Elizabeth City, Contr. NOy 91332, Spec. 48267. Plans deposit $25.

† **S. C., Sumter**—DINING HALL—BA About 12/7—U. S. Eng., 31 Customhouse, Charleston, constr. airmen's dining hall, Shaw Air Force Base, ENG-38-081-57-11. CD 8/27.

HEAVY CONSTRUCTION—LB & CA

VIRGINIA—Commonwealth of Va., Dpt. Hys., Central Highway Office Bldg., 1221 E. Broad St., Richmond,

Gorman-Rupp Contractors' Pump

KEEPS PENNA. DAM JOB MOVING

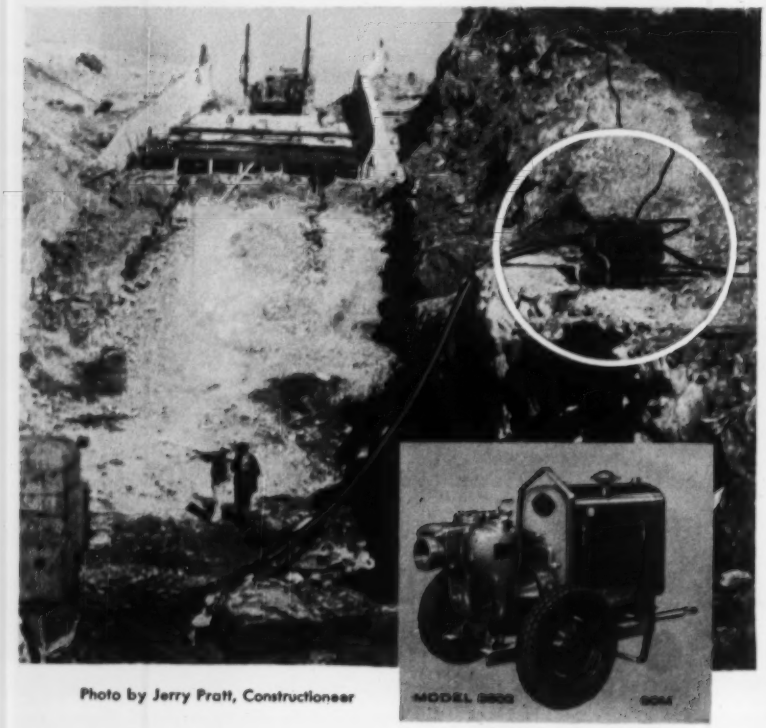

Photo by Jerry Pratt, Constructioneer

Near Spring Grove, Pennsylvania, a 1,100,000,000-gallon earth dam is being constructed for P. H. Glatfelter Co., producers of paper, by Central Pennsylvania Quarry, Stripping and Construction Co. Seepage in the spill-basin is quickly removed by a Gorman-Rupp 90M Pump, Model 3602, letting work proceed on the removal of solid rock. The pump stands about 20 feet above water level and is discharging over the rise, as shown in the upper right of the picture. The 500-ft. spillway chute handles overflow from the 2½-sq.-mile dam.

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Va.—Malpass Constr. Co., Inc., 111 W. Berkley Ave., Norfolk 6, Va., LB $78,111 (6 bidders) bridge and approaches over Holly Creek, Rte. 626, State Proj. 1346-08-09, Fed. Proj. S-174 (3), Isle of Wight Co.;

Va.—**Harwood Constr. Co.**, Law Bldg., Newport News, Va., LB $75,000 (3 bidders) toll plaza, admin. bldg. and appurtenances, toll collecting and recording equip. at Grey's Point, Middlesex Co.;

Va.—**B. G. Young & Sons**, Box 333, Johnson City, Tenn., LB $103,636 (3 bidders) bridge and box culvert and approaches, Rte. 66, State Proj. 2484-10-11-12-13, Fed. Proj. S-973 (1), Scott Co.;

Va.—**A. B. Torrence & Co., Inc.**, P.O. Box 217, Elkton, Va. LB $79,342 (4 bidders) 2 bridges, Pass and Dry Run, Rte. 211, State Proj. 1769-12-13-15, Fed. Proj. F 01-1 (13), Page Co. Bids Oct. 24. CD 10/8.

▲ **VIRGINIA**—Commonwealth of Va., Dpt. Hys., Central Highway Office Bldg., 1221 E. Broad St., Richmond,

Va.—**Rogers Bros., Contractors**, Grundy, Va., LB $92,653 (3 bidders) soil aggregate, bit. surf. tr. 2.44 mi. Rte. 661, State Proj. 1325-10-11, Fed. Proj. S-201 (3), Dickenson Co.;

Va.—**W. H. Scott, Inc.**, Box 418, Franklin, Va., LB $150,661 (2 bidders) C. conc. 0.76 mi. Lancaster and Middlesex Counties;

Va.—**Pioneer Constr. Co., Inc.**, Box 137, Roanoke, Va., LB $98,134 (4 bidders) soil aggregate, bit. surf. tr. 1.84 mi. Rte. 649, State Proj. 1393-05, Fed. Proj. S 972 (1), Warren Co.;

Va.—**Peninsular Engineering Co., Inc.**, 103 Jordan Ave., Hampton, Va., LB $114,491 (3 bidders) soil aggregate, bit. surf. tr. 3.95 mi. Rtes. 718, 622, State Proj. 1399-07-09, Fed. Proj. S-858 (2); S-727 (2), York Co.;

Va.—**Laramore Constr. Co., Inc.**, Box 348, Danville, Va. LB $535,362 (7 bidders) b. conc. 6.25 mi. Rte. 58, State Proj. 1741-28-32, Fed. Proj. F-024-2 (4), Halifax Co.;

Va.—**L. S. Abernathy & Co.**, Rte. 4, Glenn Allen, Va., LB $164,921 (2 bidders) soil aggregate 0.44 mi.; c. conc. 0.09 mi. Rte. 33, State Proj. 1963-04-05-06-07, Fed. Proj. S-436 (4); S-436 (9), New Kent and King William Counties. Bids Oct. 24. CD 10/8.

Cheney Electric Co. of Charlotte, Inc., 1700 Hutchison Ave., Charlotte, N. C. CA $91,668, telephone lines, Proj. SC 5218, Bowman, Orangeburg Co., SOUTH CAROLINA. Bowman Telephone Co., Inc., Bowman, S. C., McCall-Thomas Eng. Co., Orangeburg, S. C., engrs. Bids Oct. 11.

† **Manu-Mine Research & Development Co.**, Windy Hill, Angelica, Reading, Pa., CA $919,000, heating plant, boiler and outside utilities for Naval Minecraft Base, NBy 4928, CHARLESTON, S. C. P. Wks. Officer, Dpt. Navy, Sixth Naval Dist., Bldg. 12, U. S. Naval Base, Charleston, S. C. Bids Oct. 25. CD 10/2.

† **Standard Dredging Corp.**, 6201 France Rd., New Orleans, La., CA, $219,200, maintenance dredging in Gulfport Harbor, MISSISSIPPI. U. S. Eng., 2301 Grant St., Mobile 7, Ala. Bids Oct. 18.

▲† **R. G. Foster & Co.**, P.O. Drawer 8, Wadley, Ga. CA $1,196,979, est. $1,199,848. 10,000 ft. runway, 300 ft. wide air base runway, Columbus Air Force Base, COLUMBUS, MISS. U. S. Eng., P.O. Box 1169, Mobile, Ala. Awarded Oct. 26. CD 9/16/55.

BUILDINGS—LB & CA

▲ **A. B. Newton Co.**, Vidalia, Ga., LB $1,241,000. JUNIOR-SENIOR HIGH SCHOOL (colored); Elementary SCHOOL (white); East Griffin Elementary SCHOOL addn. (white); Spalding JUNIOR HIGH SCHOOL remodeling (white), Spalding JUNIOR HIGH SCHOOL GYMNASIUM (white); Fairmont Elementary SCHOOL addn. (colored), Moore Elementary SCHOOL addn. (colored), Annie Shockley Elementary SCHOOL addn. (colored); Griffin HIGH SCHOOL alterations and mech. remodeling (white) shop bldg., Griffin HIGH SCHOOL (white), Spalding Co., GRIFFIN, GA. State School Bldg. Auth., 244 Washington St. S.W., Atlanta, Ga. Bids Oct. 23. CD 9/21.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

Ill., Chicago—BA 11/13—City, City Hall, Contract 3-B-1, Calumet Skyway Toll Bridge, substructure main ramps, storm sewers, bit paving, Stony Island from E. 76 Pl. to S. Anthony Ave. H. W. Lochner & Co., 150 N. Wacker Dr., Chicago, section engr. DeLeuw, Cather & Co., 150 N. Wacker Dr., co-or engrs.

BUILDINGS—BA

▲ **Ill., Chicago**—OFFICE—BA 11/14—Mutual Trust Life Insurance Co., 135 S. La Salle St., Chicago, 6 story office, Wacker Dr. and Monroe St. $2,500,000. Perkins & Will, 309 W. Jackson Blvd., archts. CD 8/27.

▲ **Ind., Hobart**—SCHOOL—BA 11/14—Hobart Twp. School, 3452 Central Ave., East Gary, 2 story, brick, Hobart Twp. High School, Huber Blvd. $1,500,000. Wildermuth & Wildermuth, 527 Broadway, Gary, archts. CD 9/17.

▲ **OHIO**—State Hy. Dpt., Columbus, Zone 15,

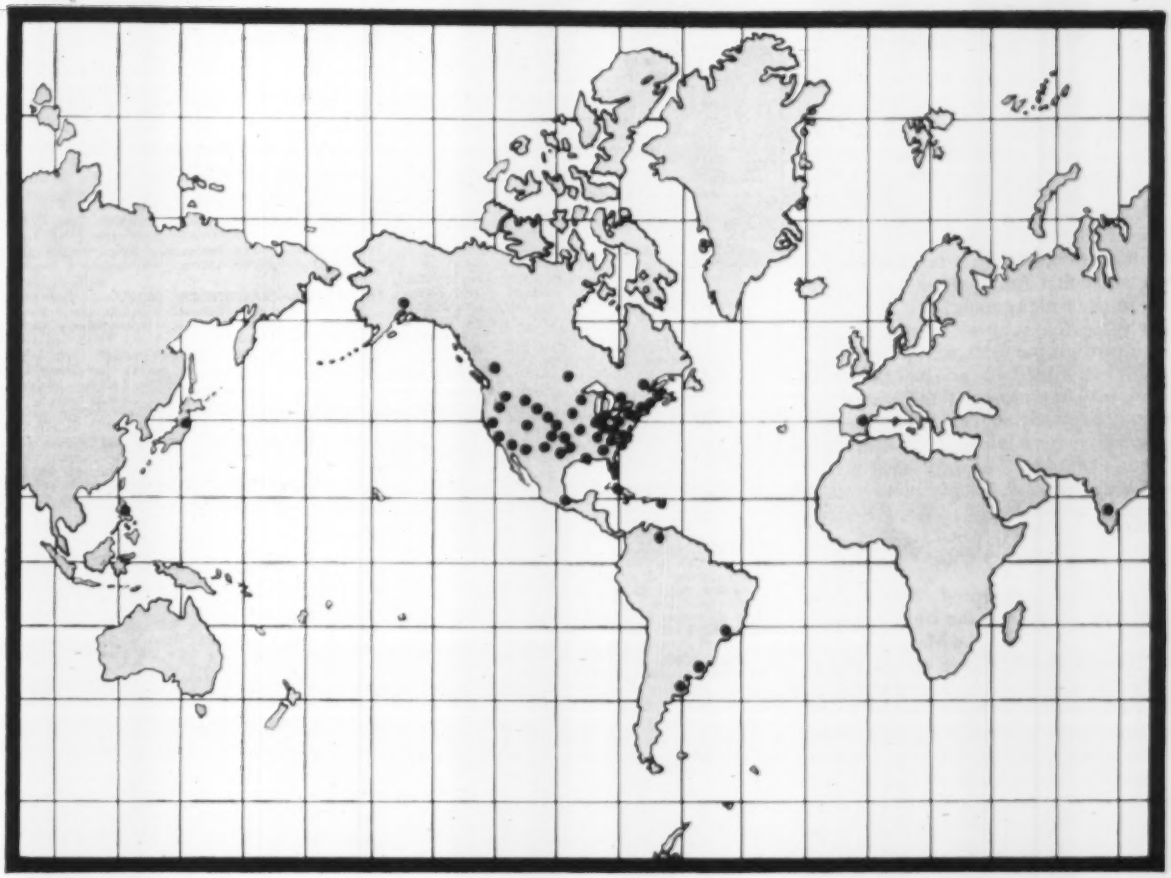
O.—**C. F. Replogle Co.**, 122½ N. Court St., Circleville, O., CA $3,148,976, Type T-71 and structures 6.061 mi. USR 40, Richland Twp. and Village of St. Clairsville, Sect. 16.80, 1-610 (18), Proj. 436, Belmont Co.;

O.—**Bates & Rogers Constr. Corp.**, 600 W. Jackson Blvd., Chicago, Ill., CA $7,805,139, est. $7,594,800, Type T-71 and structures 10.522 mi. USR 40, Butler and Cleveland, Sect. 19.78, 1-1057 (3), Cuyahoga Co.;

O.—**D. R. Smalley & Sons, Inc.**, 436 W. Market St., Celina, O., CA $4,698,862, est. $5,486,500, Type T-71 and structures 10.522 mi. USR 40, Butler and Wayne Twps. Sect. 16.16, I-IN-1097 (2) Montgomery Co.;

O—**V. N. Holderman & Sons, Inc.**, 890 Oakland Park Ave., Columbus, O., CA $3,070,917, est. $3,351,500, Type T-71 and structures 6.235 mi. USR 21, City of

(Continued on page 118)



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(Continued from page 116)

Massillon and Perry, Jackson and Lawrence Twps. Sects. 12.39. F-1010 (4), Stark Co.;

O—**Harper Supply Inc. & Miller Bros. Inc.**, 118 W. Front St., Napoleon, O., CA **$1,381,736**, est. $1,558,000, Type T-35 on B-20 and structures, USR 68, Jackson, Marion, Eagle and Liberty Twps. and City of Findlay, Sect. 11.47, Hancock Co. Grand total $20,105,630. Bids Oct. 16. CD 10/25, under LB.

ILLINOIS—State Div. Hys., Centennial Bldg., Springfield,

Regenhardt Constr. Co., Cape Girardeau, Mo., LB **$119,592**. 3-span steel WF-beam railroad grade separation structure, carrying S.B.I. Route 142 over Southern Ry. on Ill. Rte. 37, north of Mt. Vernon, Jefferson Co. Bids Oct. 23 (Correction—low bidder) CD 10/26, under LB.

▲ **Steenberg Constr. Co.**, 1371 Marshall Ave., St. Paul, Minn., LB **$1,348,507** (7 bidders) general contract sewage treatment plant and interceptor sewerage sys., SUPERIOR, WIS. City, City Hall, Superior, Wis. Bids Oct. 23. CD 9/12.

Charles J. Rogers, Inc., 14836 Grand River Ave., Detroit 27, Mich., CA **$242,000**, excavation at Springwells Station expansion, DETROIT, MICH. City, Oscar A. Wagner, pres. Bd. Water Comrs., 735 Randolpha St., Detroit 28, Mich. Bids Sept. 26. CD 9/13.

† **S. J. Groves & Son**, Temple Bldg., Minneapolis, Minn. CA **$771,595**, airfield pavements, K. I. Sawyer Air Force Base, MARQUETTE, MICH. U. S. Eng., 600 E. Jefferson Ave., Detroit, Mich. Bids Sept. 20. CD 10/9, under LB.

BUILDINGS—LB & CA

S. & S. Development Co., 1720 Section Rd., Cincinnati, O. Own Forces. **$560,000**, 32-one story brick bsmnt. HOMES, Riddle Rd., CINCINNATI, O. Jerry Sciaidone, 1720 Section Rd., Cincinnati, O., archt. Gordon Russell Neal & Assocs., Kemper Lane and William Howard Taft Rd., Cincinnati, O., engrs. Awarded Oct. 22.

▲ **H. F. Jergens Co.**, 15430 Edgewater Dr., Lakewood, O. LB **$758,370**, general constr. for complete constr. JUNIOR HIGH SCHOOL, MAPLE HEIGHTS, O. Maple Heights Bd. Educ., 5500 Clement Dr., Maple Heights, O. Bids Oct. 23. CD 9/25;

Kahn Plumbing & Heating Co., 2709 E. 93 St., Cleveland, O. LB **$378,800**, plumbing, heating, and ventilating for complete constr. high school (Maple Heights, O.).

Paugh & Brown, 6007 Euclid Ave., Cleveland 3, O., LB **$469,882**, general constr. for incomplete bldg. of HIGH SCHOOL, (Maple Heights, O.).

▲ **Clearing Industrial District**, 6455 S. Central Ave., Chicago, Ill., CA **$1,500,000**. 1 story, no bsmnt. 156,000 sq. ft., brick, FACTORY, Wolf Rd. near Addison, FRANKLIN PARK, ILL. Reliable Electric Co., 3145 W. Carroll Ave., Chicago, Ill.

▲ **J. L. Simmons Co., Inc.**, 506 S. Wabash Ave., Chicago, Ill., CA **$1,069,400** (4 bidders) general contract ADULT EDUCATION CENTER, MADISON, WIS. University of Wisconsin Foundation, 950 University Ave., Madison, Wis. Bids Oct. 18. CD 9/5.

▲ **George W. Lathrop & Sons, Inc.**, Shaw Lane, East Lansing, Mich. LB **$3,538,353**. RESIDENCE HALL, Proj. 87, ANN ARBOR, MICH. The Regents of the University of Michigan, W. K. Pierpont, vice pres., Plant Service Bldg., Ann Arbor, Mich. Bids Oct. 18, CD 10/9;

Illinois Range Co., Mount Prospect, Ill. LB **$379,857**. food facilities (Ann Arbor, Mich.).

Atkin-Fordon Co., 7360 W. Chicago Ave., Detroit 4, Mich. CA **$602,000**, general constr. JUNIOR HIGH SCHOOL, FARMINGTON, MICH. City, 33312 Grand River St., Farmington, Mich. Bids Oct. 16. CD 10/24, under LB.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

▲ **Colo., Aurora**—BA 11/13—City, City Hall, supplying 120,000 ft. 36 and 24 in. steel pipe and misc. fittings, $1,000,000 supplying filter plant equip. for water supply sys., Platte River Proj. $100,000. Extended date. Ken R. White, 3842 Wynkoop St., Denver, engr.-archt. CD 9/26.

† **Minnesota**—BA About 11/14—U. S. Eng., 1217 U. S. Post Office and Custom House, St. Paul, Zone 1, security fencing, Lower Lock and Dam, St. Anthony Falls, Mississippi River, Minneapolis, CIVENG-21-018-57-42. CD 9/23/55.

† **Iowa**—BA 11/20—Bureau Reclamation Dpt. Interior Bldg. 1A, Denver Federal Center, Denver, Colo., one 75,000/100,000/125,000 kva autotransformer for Sioux City Sub-station, Missouri River Basin Proj., Transmission Div., Spec. DS 4764. Extended date. L. N. McClellan, Bldg. 1A, Denver Federal Center, Denver, Colo., ch. engr. CD 9/18.

† **New Mexico**—BA 11/27—Bureau Reclamation, Dpt. Interior, U. S. Court House, El Paso, Tex., furnishing, labor and materials for reconductoring the Elephant Butte-Socorro 115-kv transmission line, Rio Grande Proj., near Truth or Consequence and Socorro, Spec. DC-4796, adv. ENR 11/8. CD 9/10.

† **Wyoming**—BA 12/6—Bureau Reclamation, Dpt. Interior, Glendo, earthwork, structures, bridge and surf. for access road to Fremont Canyon Power Plant, Missouri River Basin Proj., 35 mi. from Casper, Spec. DC 4793, adv. ENR 11/8. CD 5/25/44.

† **Montana**—BA 12/11—Bureau Reclamation, Dpt. Interior, Bldg. 53, Denver Federal Center, Denver 2, Colo., furnishing one 75 in. steel discharge pipe approx. 335 ft. long for Helena Valley Pumping plant, Missouri River Basin Proj., Inv. DS 4797, adv. ENR 11/8. CD 9/7.

BUILDINGS—BA

Tex., Austin—MAINTENANCE, etc.—BA 11/15—State Hy. Dpt., Austin, addns., imprvs. to utility sys. and constr. maintenance bldg. for State Hy. Dpt. at Camp R. M. Hubbard. Atwell C. Lagow, 604 W. 17 St., engr. CD 8/13.

▲ **Colo., Denver**—SCHOOL—BA 11/21—School Dist. No. 1, 414 14 St., Sabin School, West Dartmouth and S. Vrain Sts. $2,500,000. Alfred Watts Grant, 1640 Court Pl., engrs.-archts. CD 12/8.

HEAVY CONSTRUCTION—SLC

Tex., Houston—Kinkaid Preparatory School, 1301 Richmond St., soon lets contract, water sys. $45,000.

Tex., Houston—Kinkaid Preparatory School, 1301 Richmond St., soon lets contract, sanitary-storm sewers. $75,000.

Tex., Houston—PLAYGROUNDS, COURTS—Kinkaid Preparatory School, 1301 Richmond St., soon lets contract, playgrounds, courts. $75,000. Lloyd & Morgan, 4605 Montrose St., archts.

Tex., Houston—Kinkaid Preparatory School, 1301 Richmond St., soon lets contract, grounds development for campus area, earthwork, grading, filling, leveling, landscaping. $48,500.

BUILDINGS—SLC

▲ **Tex., Houston**—SCHOOL, etc.—Kinkaid Preparatory School, 1301 Richmond St., soon lets contract, fine arts center, $355,000 high school-auditorium, $365,000; Junior High School, $350,000; elementary school, $350,000. Lloyd & Morgan, 4605 Montrose Blvd., archts. CD 10/11.

HEAVY CONSTRUCTION—LB & CA

▲ **George A. Gerstner, d b a Electric Service Co.**, 2209 S. 12 St., St. Louis 4, Mo. LB **$1,229,678**, est. $1,328,000. install new mercury vapor lighting and underground conduit on Franklin and Easton Ave. (Part 4); Grand Blvd. and East Grand Ave. (Part 3); and Gravois Ave., 13th St. and parts of Mullanphy St., etc. (Part 2), ST. LOUIS, MO. City, Frank J. McDevitt, pres. B. P. Service, 304 City Hall, 12 Blvd. and Market St., St. Louis 3, Mo. Bids Oct. 23. CD 10/16;

L. E. Myers Co., 201 S. Central Ave., Clayton 5, Mo. LB **$361,360**, est. $382,000. install mercury vapor lighting and underground conduit on Gravois Ave., Grand Blvd. to Chouteau Ave.; 13 St., Cass Ave. to Mullanphy St. and parts of Mullanphy St., Palm St., and North Florissant Ave. 5.09 mi. in Part 2 (St. Louis, Mo.);

B. Oron Electrical Co., Inc., 1818 Cleveland Ave., Granite City, Ill. LB **$552,494**, est. $591,000. (3 bidders) mercury vapor lighting and underground conduit Grand Blvd. and East Grand Ave. from Holly Hills Blvd. to North Broadway 8.26 mi. Part 3 (St. Louis, Mo.);

Sachs Electrical Corp., 5540 W. Park Ave., St. Louis 10, Mo. LB **$344,000**, est. $255,000. (3 bidders) mercury vapor lighting and underground conduit Franklin and Waston Aves. from N. Jefferson Ave. to western city limits 4.85 mi. Part 4 (St. Louis, Mo.).

Pacific Iron & Steel Corp., 11633 S. Alameda St., Los Angeles, Calif. CA **$847,550**. steel fabrication and erection for Braniff Maintenance Base, DALLAS, TEX. Braniff International Airways, Inc., 3309 Roanoke St., Dallas, Tex. (Correction-contractor). CD 10/24, under CA.

Thomas S. Byrne, Inc., 1607 Fort Worth Natl. Bank Bldg., Fort Worth, Tex. CA **$75,000**. earthwork, grading, SWEETWATER, TEX. Flintkote Co., 30 Rockefeller Plaza, New York, N. Y. and c/o I. J. Harvey, Jr., 616 Hibernia Bank Bldg., New Orleans, La.

▲† **Eagle Constr. Corp.**, Box 181, Loveland, Colo. CA, **$1,120,447**. Glendo power plant and switchyard, Missouri River Basin Proj., near Glendo, Spec. DC-4967, WYOMING. Bureau Reclamation, Dpt. Interior, Glendo, Wyo. Bids Oct. 4. CD 10/9, under LB.

† **Kansas City Structural Steel**, 21 and Metropolitan Ave., Kansas City, Kan. LB **$687,644**. theater and social center, physical education bldg., IFB 05-613-57-4, COLORADO SPRINGS, COLO. Dpt. Air Force, Box 1670, Colorado Springs, Colo. Bids Oct. 23. CD 9/5.

Utility Constr. & Engineers, 1909 S. Cherokee St., Denver, Colo. CA, **$800,000**. constr. canal imprvts., Vasquez-St. Louis collection conduit Winter Park (Fraser) DENVER, COLO. Bd. Water Comrs., City & County Bldg., Denver, Colo. Awarded Oct. 23. CD 10/24, under LB.

▲ **Michigan Sewer Constr. Co.**, Box 4753, Detroit 19, Mich. LB **$3,449,215**, est. $3,911,560. Vasquez Tunnel and Jones Pass Tunnel lining, Winter Park (Fraser), Clear Creek and Grand Counties, DENVER, COLO. Bd. Water Comrs., City & County Bldg., Denver, Colo. Bids Oct. 26. CD 10/9.

BUILDINGS—LB & CA

▲ **Alexander & Kingbay**, 4641 Hiawatha Ave., Minneapolis, Minn. CA **$2,800,000**. general constr. SHOPPING CENTER, incl. 40 stores, GRAND RAPIDS, MINN. H. Shanedling Sons Corp., 2025 Nicollet Ave., Minneapolis, Minn. Thorshov & Cerny, 400 Metropolitan Bldg., Minneapolis, Minn., archts.

Nordberg Mfg. Co., 3073 S. Chase St., Milwaukee, Wis. CA **$512,069**. diesel generator for POWER PLANT, NEBRASKA CITY, NEB. City, Nebraska City, Neb. Bids Aug. 14. CD 9/14, under LB.

† **B. A. Green Constr. Co.**, Lawrence, Kan. LB **$409,544**. rehabilitation of SCHOOL BLDGS. at Haskell Institute, LAWRENCE, KAN. Bureau Indian Affairs, Box 1777, Albuquerque, N. M. Bids Oct. 18. CD 9/26.

▲ **Foster Wheeler Corp.**, 165 Broadway, New York 6, N. Y. CA Est. **$4,000,000**. 6,000 bbl. per day

ULTRAFORMER, NEODOSHA, KAN. Standard Oil Co. of Indiana, 910 N. Michigan Ave., Chicago, Ill.

▲ **James Stewart Constr. Co.**, 230 Park Ave., New York, N. Y. CA Total est. $6,500,000. 432,000 sq. ft. Southwest Homefurnishings MART, 3,000 car parking space, DALLAS, TEX. Trammel Crow, 425 S. Field St., Dallas, Tex. CD 4/17, under CA.

▲ **H E B Constr. Co.**, 946 Quintana Rd., San Antonio, Tex. CA $1,125,000. 6 story SUPERMARKET expansion, SAN ANTONIO, TEX. H. E. B. Food Stores, 1509 N. Main St., San Antonio, Tex.

▲ **Thomas S. Byrne, Inc.**, 1607 Fort Worth Natl. Bank Bldg., Fort Worth, Tex. CA $7,000,000. Gypsum Processing MILL-PLANT; CA $500,000. STORAGE-WAREHOUSING, SWEETWATER, TEX. Flintkote Co., 30 Rockefeller Plaza, New York, N. Y., and c/o I. J. Harvey, Jr., 616 Hibernia Bank Bldg., New Orleans, La. CD 7/20.

▲ **Cahill-Mooney Constr. Co.**, 1220 E. Front St., Butte, Mont. CA $2,000,000. 216,000 sq. ft. grocery WAREHOUSE for perishable goods and truck repair shop, BUTTE, MONT. Safeway Stores, Inc., 66 W. Park St., Butte, Mont. Bids Aug. 3, awarded Sept. 4. CD 7/31.

▲ **A. A. and E. B. Jones**, 1050 S. Jason St., Denver, Colo. CA $1,048,791, est. $1,250,000. general contract 3 story, 144x259 ft. HOSPITAL Addn., DENVER, COLO. Children's Hospital, 1056 E. 19 Ave., Denver, Colo. Bids Sept. 6, awarded Oct. 23. CD 9/18, under LB.

FAR WEST

BUILDINGS—BA

▲ **Calif., Patton**—KITCHEN ALTERATIONS, etc.—BA 11/28—State Div. Architecture, 1100 S. Grand Ave., Los Angeles, kitchen alterations, addns., Patton State Hospital. $1,298,500. Plans deposit $50. CD 4/24.

HEAVY CONSTRUCTION—LB & CA

NEVADA—Dpt. Hys., State Office Bldg., Carson City, **Morrison-Knudsen Co., Inc.**, 900 W 15 N, Salt Lake City, Utah, CA $419,784, stabilizing slide area US Rte. 40 near Nev.-Calif. state line, Rte. Sect. 001-1, Control Sect. WA-01. Proj. IN-001-1 (13), State Hy. Cont. 974, Washoe Co. Bids Oct. 18. CD 10/10.

▲ **CALIFORNIA**—Bureau P. Rds., Dpt. Commerce, 102 Old Mint Bldg. 5 and Mission Sts., San Francisco, **Clyde W. Wood & Sons, Inc.**, 6900 Tujunga Ave., North Hollywood, Calif., CA $1,263,756. California Forest Hy. Proj. 32-A3, Placerville-Lake Tahoe, Eldorado National Forest, El Dorado Co. Awarded Oct. 3. CD 10/3, under LB.

▲ **CALIFORNIA**—State Div. Hys., 1120 N St., Sacramento, **Madonna Constr. Co.**, P. O. Box 910, San Luis Obispo, Calif., CA $3,346,749, 4-lane divided highway 5.1 mi. and 2.2 mi. 2-lane fly. and 5 rein.-conc. bridges U.S. 101 between 1.3 mi. south of Paso Robles and 1 mi. north of Paso Robles and on Sign Rte. 41 between U.S. 101 in Paso Robles and Huer Huero Creek, San Luis Obispo Co. Bids Oct. 10, awarded Oct. 25. CD 10/12, under LB.

BUILDINGS—LB & CA

▲ **General Electric Co.**, River Rd., Schenectady, N. Y., CA Total est. $6,000,000. 5,000 kw. unit GENERATOR for Vallecitos Atomic Laboratory, PLEASANTON, CALIF. Pacific Gas & Electric Co., 245 Market St., San Francisco, Zone 6, Calif., and General Electric Co., River Rd., Schenectady, N. Y. CD 1/20.

CANADA

BUILDINGS—BA

▲ **Que., Quebec City**—CUSTOMS, etc.—BA 12/5—Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., superstructure for 200x450 ft., rein.-con., Wolfe's Cove Terminal bldg. for Customs & Immigration. $4,000,000. Plans deposit $500. Gaston Amyot, 610 Belvedere St., archt. D. D. Clerk, 322 Laurier St., engr. CD 2/2/55.

BUILDINGS—LB & CA

Frid Constr. Co. Ltd., 605 James St. N., Hamilton, Ont., CA, About $150,000. Total est. $4,500,000. caissons and piling for 12 story OFFICE, TORONTO, ONT. Shell Oil Co. of Canada Ltd., 25 Adelaide St. E., Toronto, Ont. Awarded Oct. 16. CD 2/24.

R. E. Stewart Constr. Corp., 862 Wellington St. S., Sherbrooke, Que., CA sewage disposal unit for ASBESTOS MILL exten., ASBESTOS, QUE. Canadian Johns-Manville Co. Ltd., Sun Life Bldg., Montreal, Que. Awarded Oct. 18. CD 9/4.

AMERICANS ABROAD

HEAVY CONSTRUCTION—BA

† **Spain, Torrejon**—ROCKET BASE STORAGE—BA 11/7—Bureau Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash. 25, D. C., U. S. A., base rocket storage, TOR-47, (Spanish contractors only).

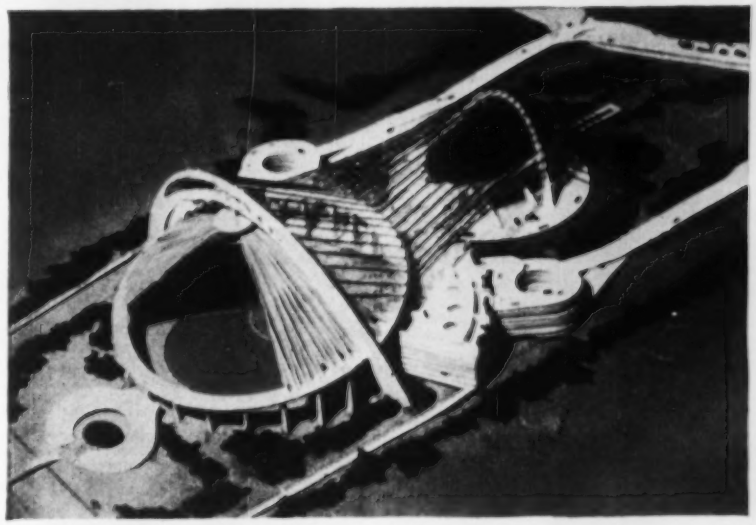
HEAVY CONSTRUCTION—LB & CA

† **Omes Icsasa**, Madrid, Spain, LB $366,280 (4 bidders) hangar and shops, MOR-27, MORON, SPAIN. Bureau Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash., 25 D. C., U. S. A. Bids Oct. 17.

† **Juliett Moro**, Madrid, Spain, LB $413,246 electrical distr. sys., MOR-25, MORON, SPAIN. Bureau Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash. 25, D. C., U. S. A. Bids Oct. 10.

† **Entrecanales**, Madrid, Spain, LB $568,211 (2 bidders) Group E, facilities MOR-26 MORON, SPAIN. Bureau Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash. 25, D. C., U. S. A. Bids Oct. 17.

MARS outstanding design **SERIES**

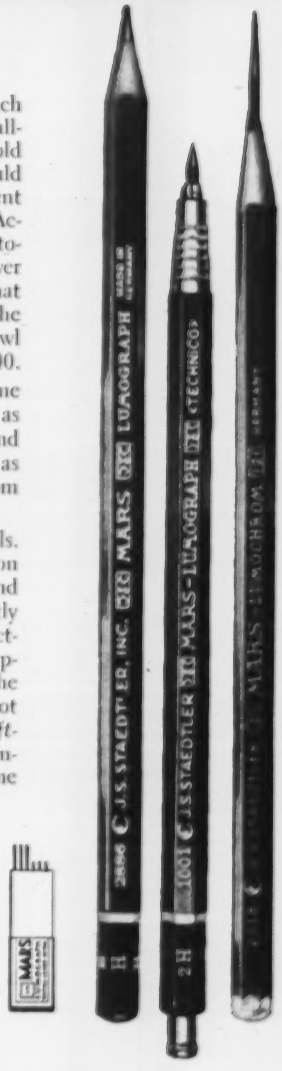


umbrella'd stadia

While it isn't always true, an interesting approach often results in a good design, as in these twin all-weather stadia designed by Harry Barone and Arnold Horn, Pratt architecture students. Each bowl would be umbrella'd by its own tentlike roof of translucent plastic, hung from the center of soaring arches. Accordion-pleated, these roofs are planned to fold together out of the way in fair weather, their lower edges riding along the rims of the bowls. Cables that guy the arches form a decorative pattern tying the two stadia together. The big football-baseball bowl would hold 65,000 spectators; the smaller, 20,000.

No matter which of today's bright ideas become tomorrow's reality, it will be as important then as it is now to use the best of tools when pencil and paper translate a dream into a project. And then, as now, there will be no finer tool than Mars—from sketch to working drawing.

Mars has long been the standard of professionals. To the famous line of Mars-Technico push-button holders and leads, Mars-Lumograph pencils, and Tradition-Aquarell painting pencils, have recently been added these new products: the Mars Pocket-Technico for field use; the efficient Mars lead sharpener and "Draftsman's" Pencil Sharpener with the adjustable point-length feature; and—last but not least—the Mars-Lumochrom, the new colored *drafting* pencil which offers revolutionary drafting advantages. The fact that it blueprints perfectly is just one of its many important features.



The 2886 Mars-Lumograph drawing pencil, 19 degrees, EXEXB to 9H. The 1001 Mars-Technico push-button lead holder. 1904 Mars-Lumograph imported leads, 18 degrees, EXB to 9H. Mars-Lumochrom colored *drafting* pencil, 24 colors.

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PROPOSED PROJECTS

WATER SUPPLY

N. C., Pine Level—Town, water proj., incl. wells, treatment plant, storage tank, distr. lines, hydrants and meters. $150,000.

Okla., Claremore—City, City Hall, defeated $180,000 bonds Oct. 9, WW exten. Black & Veatch, 4706 Broadway, Kansas City, Mo., consult. engrs. CD 9/24.

Okla., Wagoner—City, City Hall, defeated $437,500 bonds Oct. 9, plant imprvs. Wood & Craig, Philtower Bldg., Tulsa, consult. engrs. CD 9/27.

Tenn., Collinwood—Town, Town Hall, water sys., incl. pumping and treatment station, distr. sys. $143,000.

Tex., Goldsmith—City, City Hall, voted bonds Oct. 2, water lines, $60,000; water storage, $55,000; water supply, $45,000. CD 9/6.

Wash., Bremerton—City, City Hall, 2 m.g. reservoir at E. 17 St. and Ironsides Ave. $125,000. Bids this year; enlarging capacity of East Side reservoir, near Hall's Corner, $50,000. Bids next year. C. C. Casad, water supt.

Wis., Belgium—Village, Village Hall, bond election Nov. 6, WW sys. $150,000.

SEWERS, WASTE DISPOSAL

Ala., Birmingham—City, Dpt. P. Imprvts., City Hall, sanitary sewers in Roebuck area, $100,370. A. L. McWhorter, city engr. CD 12/22/53.

Conn., New Haven—City, City Hall, sanitary sewers Wards 31 and 33, $450,000; 5,000 lin. ft. sanitary sewers, Ward No. 32, $150,000; sanitary sewers, Kohary Tract, $250,000; Boulevard Sewage disposal plant, $225,000. Wm. Bolton, city engr.

Minn., Hampton—Village, H. E. Latimer, clk., sanitary sewerage sys. and sewage disposal plant. $100,000. Comstock & Davis, Hy. No. 218, Rosemount, consult. engrs.

N. J., Wildwood—City Comrs., City Hall, sanitary and storm sewer imprvs. various locations. $140,000. C. B. Middleton, 134 E. Shellenger Ave., engr.

N. Y., Ithaca—Town, Town Hall, sanitary sewerage sys. and treatment plant, $250,000. CD 6/18/47.

Okla., Grove—City, City Hall, voted bonds Oct. 16, sewers and disposal plant. $200,000. J. K. Lindsay, Tahlequah, consult. engr. CD 10/11.

Tex., Brownsville—City, voted bonds Oct. 13, sanitary sewer lines, $200,000; sewage disposal unit, $100,000. CD 9/28.

Tex., Dallas—Centex Constr. Co., 4606 Greenville St., storm sewers, $75,000; sanitary sewers, $77,000, miscellaneous areas.

Tex., Dallas—Hockaday Square Development Corp. c/o Frank H. Malone, 401 Wynnewood Village, Dallas, storm sewers $75,000, sanitary sewers $75,000, (Hockaday Square subdivision, 93 acre for Hi class residences).

Tex., Mesquite—Big Town Co., c/o Wes Fenton, 1006 Davis Bldg., Dallas (Gerri von Frellick, 300 Equitable Bldg., Denver, Colo.—developer), plans by Tatum & Quade, 2812 Fairmount St., Dallas, sanitary-storm sewers. $100,000. Shrewsbury-Tharaldson Assocs., 216 S. Central St., Glendale, Calif., designers. CD 5/4.

BRIDGES

▲ **CALIFORNIA**—State Dpt. P. Wks., Div. of Hys., 1120 N St., Sacramento,

Butte Co.—reconstructing Bear Creek Bridge Rte. 21 (US 40 Alt.) $25,000.

Del Norte Co.—new bridges and approaches Minot Creek and High Prairie Creek, Rte. 1 (US 101) $235,000.

Humboldt Co.—structures and approaches for 4-lane expressway Rte. 1 (US 101) 0.2 mi. north of - Fortuna to 0.4 mi. north of Fernbridge, $515,000. structure (addn. Mad River Bridge) Mad River Rte. 1, U.S. 101, $500,000.

Kern Co.—wid'n. bridges and approaches Buena Vista Slough Bridge, Rte. 58 (SR 178), $45,000.

Los Angeles Co.—structure and approaches Olympic Freeway-Harbor Freeway Interchange (portions) Rte. 173 (SR 26), $1,400,000. structure (Los Angeles River and Santa Fe R. R. yard) for future 8-lane freeway 0.3 mi. Olympic Freeway west, right of way line of Santa Fe Railroad yard to 8 St., Rte. 173 (SR 26), $7,000,000.

Marin Co.—pedestrian overcrossing Rte. 1 (US 101) 0.2 mi. north of Richardson Bay Bridge, $60,000.

Marin and Sonoma Counties—bridge 4-lane and approach embankments Rte. 8 (SR 37) Petaluma Creek Bridge, $2,300,000.

Mendocino and Sonoma Counties—new bridge and approaches 0.9 mi. Rte. 56 (SR 1) Gualala River, $625,000.

Napa Co.—superstructure Sage Creek Bridge Rte. 102 (SR 128), $15,000.

Riverside Co.—new bridge Colorado River near Blythe, Rte. 64 (US 60-70), $600,000. bridges and approaches 0.3 mi. Antsell Rock Creek, Servo Creek and South fork on San Jacinto River, Rte. 64, (SR 74), $220,000.

Sacramento and Solano Counties—sub-structure Sacramento River Bridge at Rio Vista, Rte. 53 (SR 12), $1,150,000.

San Benito Co.—reconstr. bridges and approaches 0.1 mi. San Benito River, Rte. 2 (US 101), $185,000.

San Diego Co.—structure and approaches 1 mi. Clairemont Mesa Blvd. Interchange, Rte. 77 (US 95), $800,000. new bridges and approaches 1.2 mi. Fry Creek Bridge and Big Fry Creek Bridge, Rte. 195 (SR 76), $200,000.

Solano Co.—structure and approaches Rte. 7 (US 40 Interchange at SR 12) (west of Fairfield), $1,100,000. structure and approaches (Benicia Arsenal Interchange) Rte. 74 (SR 21) New SR 21 to 1.25 mi. north of Benicia Arsenal, $375,000.

Trinity Co.—repairing bridge Rte. 29 (SR 36), Salt Creek Bridge, $18,000.

Tulare Co.—structures and approaches 6 St. Overcrossing at Tipton, Rte. 4 (US 99), $165,000.

Ventura Co.—structure and approaches Ventura-Freeway-Rose Road Interchange, Rte. 2 (US 101), $250,000. bridge and approaches 0.1 mi. Arroyo Simi Bridge Rte. 9 (SR 118), $179,000.

Yolo Co.—structure (David Interchange) Solano County Line to Swingle, Rte. 6 (SR 40), $320,000.

Ill., Chicago—City, City Hall, reconstr. Wabash Ave. viaduct. $380,000.

N. J., New Brunswick—Bd. Freeholders Middlesex Co., new bridge replacing destroyed structure between Piscataway and Dunellen, Piscataway Twp., Dunellen Boro, $110,000. Herbert R. Fleming Co., Record Bldg., consult. engr. CD 1/23/46.

OKLAHOMA—State Hy. Dpt., Capitol, Oklahoma City, Zone 5.

McClain Co.—concrete, steel bridges, Hy. 124 at Payne. $100,000. G. H. Bittle, c/o owner, engr.

STREETS AND ROADS

CALIFORNIA—State Div. Hys., 1120 N St., Sacramento,

Alameda Co.—grading, surf. 2.5 mi. and bridge on Alvardo-Niles Rd., between Alquire Rd. and Decoto Rd., FAS S-1026 (2), $250,000. Bids in March or April.

Lassen Co.—surf. 6.2 mi. at Bieber Cutoff between 5.2 mi. east of Bieber and the Adin-Susanville Road 5 mi. south of Adin, FAS Co. Rte. S-1246 (2), $180,000.

▲ **CALIFORNIA**—State Dpt. P. Wks., Div. Hys., 1120 N St., Sacramento,

Alameda Co.—grading, paving, structures 0.9 mi. for 8-lane Eastshore Freeway 0.25 mi. east of Fallon St. to 0.22 mi. west of Market St. Rte. 69, SR 17. $6,400,000. shoulders 1.8 mi. San Mateo-Hayward Bridge to Eden Landing Road, Rt. 105. $100,000. reconstr. storm drains Rte. 105, East 14 St. in Oakland between 77 and 74 Avenues at Arroyo Viejo Creek. $250,000. reconstr., wid'n. 0.5 mi. Rte. 226, East 14 St. in San Leandro to 0.1 mi. west of Southern Pacific R. R. cossing. $165,000. grading, surf. Rte. 227, Mountain Blvd. in Oakland, between U. S. 50 near Calaveras Ave. and SR 24 (portions). $300,000.

(Continued on page 122)

Where floor space is a problem — or where stacking and paralleling is indicated — the new Miller SRH LOWBOY is the engineered-to-your-needs answer! This dc rectifier type welder is available in three models with 60% duty cycle ratings of 200, 300 and 400 amperes. Combining compactness with quiet operation, minimum arc blow, top electrical efficiency and waterproof construction, the LOWBOY is another Miller first that "figures."

Upright SR models to 600 amperes at 40 volts with 750 amperes maximum output; Duplex units up to 1200 amperes, 40 volts, 1500 amperes maximum.

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ELECTRIC MANUFACTURING CO., INC.

APPLETON, WISCONSIN

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In addition to Bethlehem Longspans the San Leandro, Calif., distribution center of Western Electric Company contains 583 tons of Bethlehem structural shapes. *Architects and Engineers:* Lockwood and Greene Engineering, Inc., New York City. *General contractor:* Swinerton and Walberg Company, San Francisco and Oakland.

NEW WESTERN ELECTRIC BUILDING HAS NEARLY 7 MILES OF LONGSPANS

A new Western Electric Company distributing house at San Leandro, Calif., contains 482 tons of Bethlehem Longspan Joists — or 35,317 lineal ft — in the roof structure.

The new structure measures 425 by 525 ft and covers some five acres of ground. It is a distribution center for telephone supplies to Pacific Telephone and Telegraph Company's Northern California area.

Bethlehem Longspans were selected for the roof structure of this building for a number of reasons. Longspans allowed the planners to make maximum use of floor space, because supporting columns could be reduced to the fewest possible. Pipes and conduits could be run right through the open webs of these joists, greatly simplifying the installation of electrical and heating systems. Bethlehem Longspans saved construction time, too. They arrived at the job site fully fabricated, clearly marked and ready for immediate placing.

Bethlehem Longspans are good joists to remember when you are planning a building where maximum unobstructed floor space is a paramount consideration. The nearest Bethlehem sales office will be glad to furnish full information about Bethlehem Open-Web Steel Joist, both Longspan and Shortspan series. Or write to us at Bethlehem, Pa.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM LONGSPAN JOISTS

BETHLEHEM STEEL

(Continued from page 120)

Alpine Co.—grading, surf. 5.8 mi. Rte. 34 (SR 88) Red Lake Dam to 1.5 mi. east of Blue Lakes Road. $800,000.

Amador Co.—grading, surf., structures (realignment) 7.4 mi. Rte. 34, 65 (SR 88, 49), Loncha Plana Road to 0.5 mi. east of Martell. $1,010,000.

grading, surf. 3.8 mi. Rte. 34 (SR 88) Silver Lake to Alpine County Line (portions). $400,000.

Butte and Plumas Counties—lining tunnels Rte. 21 (OUS 40 Alt.) Arch Rock, Elephant Butte and Grizzly Dome Tunnels (portions). $60,000.

Butte Co.—grading, surf., structures 5.9 mi. Rte. 47 (SR 32) Glenn County Line to 2½ mi. west of Chico. $475,000.

grading surf., drainage 1.1 mi. Rte. 47 (SR 32) Junction US 99E via 8 and 9 Sts. to Fir St. east of Chico. $230,000.

grading, surf. structures 5.4 mi. Rte. 87, 21 (US 40 Alt.) Union School to Montgomery St. in Oroville. $750,000.

Calaveras Co.—grading, surf. 6.6 mi. Rte. 24 (SR4) Murphys to Big Trees (portions). $550,000.

grading, surf. 2 mi. Rte. 65 (SR 49) Through Mukelumme Hill. $340,000.

Colusa Co.—base and structures, wid'n. structure 8.9 mi. Rte. 15 (SR 20), Williams to Sacramento River Bridge (portions). $350,000.

Contra Costa Co.—grading, paving, structures for 6-lane freeway in vicinity of Walnut Creek (Walnut Creek By-pass) 4.2 mi. Rte. 75, 107, (SR 24, 21) East of Pleasant Hill Road to west of Walden Road, with connection to SR 21 at Crest Ave. $7,500,000.

reconstr. 6.6 mi. Rte. 75 (SR 4) SR 24 to Brentwood. $305,000.

El Dorado Co.—grading, surf. structures for 2-lane and 4-lane highway 5.2 mi. Rte. 11 (US 50) Mays to Nevada State Line. $350,000.

grading, surf. 2.4 mi. Rte. 93, Georgetown to 2.4 mi. west. $145,000.

Fresno Co.—grading, surf. 2.3 mi. Rte. 41 (SR 180) Ventura Ave. from "R" St. to Chestnut Ave. $750,000.

grading, surf., structure 1.4 mi. Rte. 41 (SR 180) 0.7 mi. east of Reed Ave. to 2.3 mi. east of Friant-Kern Canal (portions). $230,000.

grading, surf. 2.6 mi. Rte. 125 (SR 41) Shaw Ave. to 0.8 mi. north of Herndon Ave. $400,000.

grading, surf. 0.4 mi. Rte. 125 (SR 41) Ventura Ave. from "C" St. to Broadway. $28,000.

Glenn Co.—surf. 3.6 mi. Rte. 7 (US 99W) 3.6 mi. south of Willows to Willows. $100,000.

grading, surf., structures 11.1 mi. Rte. 47 (SR32) US 99W to Butte County line. $965,000.

Humboldt Co.—grading, surf., structures for 4-lane freeway 4.2 mi. Rte. 1 (US 101), 1 mi. south of Dyerville to Englewood. $2,605,000.

grading, surf. 4.6 mi. Rte. 1 (US 101) 0.4 mi. north of Fernbridge to 0.7 mi. north of Hookton Road. $750,000.

grading for future 4-lane expressway 3.5 mi. Rte. 1 (US 101) Patrick Point to 0.3 mi. north of Big Lagoon. $1,300,000.

Imperial Co.—grading, surf. (wid'n.) 10.3 mi. Rte. 187 (SR 115), Sandia to Alamorio. $1,480,000.

grading, paving 6.3 mi. Rte. 201 (SR 115) 0.5 mi. north of Route 187 to Standard Canal. $725,000.

Inyo Co.—grading, surf. (wid'n.) 6.4 mi. Rte. 23 (US 6-395) Black Rock to 4.4 mi. south of Big Pine. $350,000.

grading, surf. (wid'n.) 11.5 mi. Rte. 25, 76 (US 395) Texaco Corners to Birchim Canyon. $260,000.

Kern Co.—grading, paving, structures to provide 8-lane freeway 7.2 mi. Rte. 4 (US 99) Fort Tejon to 2 mi. north of Grapevine Station. $6,935,000.

grading, paving 10.2 mi. Rte. 4 (US 99) Route 129 to Delano (portions). $450,000.

grading, surf. 1 mi. Rte. 23 (US 6) Ittners to 1 mi. north. $600,000.

grading, surf. 2 mi. Rte. 57 (SR 178) 2 mi. east to 4 mi. east of Weldon. $100,000.

grading, surf. (wid'n.) 4.2 mi. Rte. 58 (US 466) 0.3 mi. west of city limit of Bakersfield to Route 143. $270,000.

grading, surf., realignment White Wolf Grade 3.3 mi. Rte. 140, 5.3 mi. east of Arvin to 2.2 mi. west of U. S. 466. $625,000.

grading, surf. (relocation) 5 mi. Rte. 145 (US 395) 0.4 mi. north of Inyokern to US 6. $160,000.

Kings Co.—grading, surf. (wid'n.) 1.9 mi. Rte. 125 (SR 41) 1.9 mi. north of Stratford to Jersey Ave. $190,000.

grading, surf. (wid'n.) 8 mi. Rte. 135, Kansas Ave. to SR 198. $770,000.

Lake Co.—grading, surf. for 2-lane highway on relocation 6.3 mi. Rte. 49 (SR 53) Cache Creek to SR 20. $950,000.

Lassen Co.—grading, surf. (reconstr.) 6.7 mi. Rte. 73 (US 395) North of Ravendale to Madeline. $750,000.

Los Angeles Co.—grading, paving addnl. lanes 2.6 mi. Rte. 2 (US 101) Hollywood Freeway-Highland Ave. to Lankershim Boulevard. $775,000.

grading, paving, structures 8-lane freeway 1.7 mi. Rte. 2, 159 (US 101) Hollywood Freeway Extension 0.2 mi. south of Moorpark St. to Kling St. on Route 159 and to 0.1 mi. west of Laurel Canyon Blvd. on U. S. 101. $5,900,000.

reconstr. 3.5 mi. Rte. 2 (US 101) 0.2 mi. south of Cheeseboro Road (west of Calabasas) to 0.15 mi. north of Lindero Creek. $250,000.

grading, paving, structures for 8-lane freeway 3.1 mi. Rte. 4, 26 (US 6-99) (US 60, 70, 99), Golden State Freeway, 0.1 mi. south of Sixth St. to 0.2 mi. north of Mission Road; and on US 60, 70-99, Flickett St. to Macy St., $8,900,000.

grading, paving, structures for 8-lane freeway 1.3 mi. Rte. 4 (US 6-99) Golden State Freeway-Alameda Avenue to Burbank Boulevard in Burbank, $3,150,000.

reconstr. 1.3 mi. Rte. 60 (US 101 Alt.) Vermont Ave. to Reed St., $120,000.

grading, paving, structures for 4-lane divided hy. 3.3 mi. Rte. 62 (SR 39) San Bernardino Freeway to Paramount Ave. in Azusa, $1,235,000.

grading, paving, structures (wid'n) 0.8 mi. Rte. 77 0.2 mi. east of San Bernardino Road in El Monte to Rio Hondo Wash, $270,000.

grading, paving, structures for 8-lane freeway 3.5 mi. Rte. 158 (SR 7), San Diego Freeway 0.2 mi. south of Venice Boulevard to 0.2 mi. north of Ohio Ave., $6,025,000.

reconstr. 14 mi. Rte. 162 (US 66) on Santa Monica Blvd. from Wilshire Blvd. to Sierra Dr. in Beverly Hills, $100,000.

grading, surf. for 6-lane divided highway 2.6 mi. Rte. 164 (SR 107) Broadway (Hawthorne) to Hillcrest Boulevard (Inglewood) $315,000.

grading, surf., structure (wid'n. railroad underpass) for 6-lane divided hy. 0.5 mi. Rte. 164 (SR 107) 0.2 mi. south to 0.3 mi. north of 190 St. (Torrance), $145,000.

grading, paving, structures (wid'n. 4-lane freeway to 6-lanes) 5.2 mi. Rte. 166 (US 101) Santa Ana Freeway-Lakewood-Rosemead Blvd. to Rosecrans Ave., $1,200,000.

grading, paving, structures for 6-lane freeway 1.1 mi. Rte. 167 (SR 15), Long Beach Freeway, 0.1 mi. south of South Junction of Atlantic Boulevard to 0.3 mi. south of Rosecrans Ave., $1,750,000.

reconstr. 1.7 mi. Rte. 168 (SR 19) on Lakewood Blvd. from Gardendale St. to Hall Road, $180,000.

grading, surf., structure 0.3 mi. Rte. 175 (SR 14) on Artesia Blvd. from Gramercy Pl. to Western Ave., $115,000.

grading, surf., structures (wid'n. to 4-lanes) 1.1 mi. Rte. 179 (SR 22), U. S. 101 Alt. in Long Beach to Los Cerritos Channel, $175,000.

Los Angeles and San Bernardino Counties—grading, paving and structures for 4-lane expressway 3.2 mi. Rte. 77 (SR 71) 0.3 mi. south of Riverside Dr. to U.S. 60 at Butterfield Road, $900,000.

Madera Co.—grading, paving, structures for 4-lane freeway 3.9 mi. Rte. 4 (US 99) 0.5 mi. south to 1.5 mi. north of Madera, $3,400,000.

Marin Co.—grading, paving, structures for 6-lane freeway 1.4 mi. Rte. 1, (US 101) Greenbrae Intersection to 0.5 mi. north of California Park Overhead $1,325,000.

Mariposa Co.—grading, surf., structures (wid'n. and realignment) 4.6 mi. Rte. 18 (SR 140) Acorn Inn to King Solomon Mine, $1,200,000.

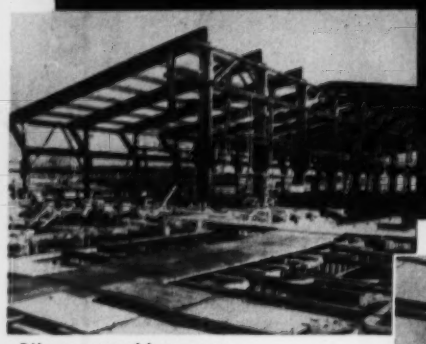
grading, surf. (some realignment) Rte. 65 (SR 49) 2 mi. north of SR 140 to Coulterville (portions), $200,000.

Mendocino Co.—grading, surf., for 4-lane expressway 3.8 mi. Rte. 1 (US 101) 0.5 mi. north of Hilvilla to 0.9 mi. south of Irvine Lodge, $2,000,000.

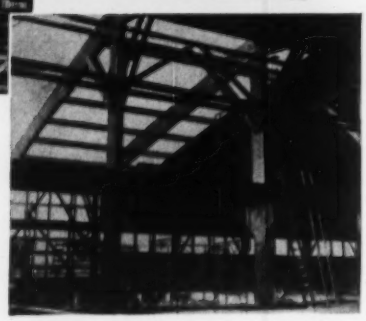
base, surf. 4.6 mi. Rte. 48 (SR 128) Robinson Creek to Maple Creek, $250,000.

(Continued on page 124)

CHEMICAL PLANT DEMANDS *Wood Post and Beam* CONSTRUCTION



Rilco post and beam construction. Weyerhaeuser chlorine plant, Longview, Washington.



Laminated roof beams are 9" x 34⅛" x 68'. Glued laminated columns are 6" x 29¼" x 24'. The structure is 300' long.

Rilco laminated wood post and beam construction was used to assure low maintenance in the new Weyerhaeuser Timber Company chlorine plant, Longview, Washington. Because of its non-corrosive qualities wood is unaffected by chemical fumes. It eliminates expensive maintenance such as repeated scraping and painting.

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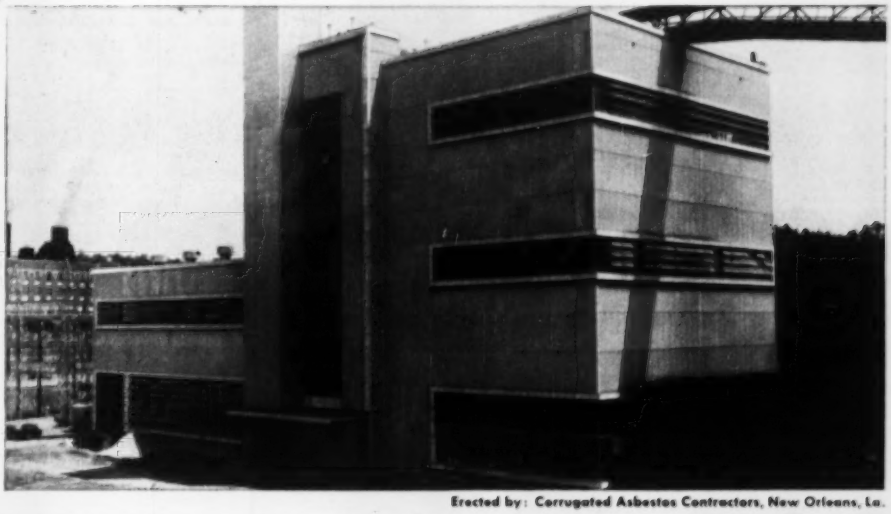

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Alabama Power Company's new steam-electric generating plant is built to supply today's expanding power needs—with Gold Bond CORRUGATED ASBESTONE "400".

They saved money here when they built, because of lower construction costs. And they'll save money again when they expand because of the unique end wall construction. When expansion is necessary all they have to do is unbolt the CORRUGATED ASBESTONE end wall, erect their addition and use the same end sheets of siding on the expanded structure!

Gold Bond CORRUGATED ASBESTONE "400" sidewalls are lifetime walls—actually grow stronger with age, and the rock-like, fireproof surface of CORRUGATED ASBESTONE eliminates maintenance costs.

How many uses can *you* think of for Gold Bond CORRUGATED ASBESTONE? Whether it's in remodeling or new construction, commercial or industrial, ASBESTONE creates striking good looks and permanence—means added strength and lower maintenance. Write for full details on this versatile, attractive material. Address Dept. EN-116, National Gypsum Company, P. O. Box 5257-B, New Orleans 15, La.

Gold Bond Technical Bulletin No. 2032 and Booklet No. 2275 give full specifications and uses of Gold Bond CORRUGATED ASBESTONE Products.

CORRUGATED ASBESTONE "400"

NATIONAL GYPSUM COMPANY

Gold Bond
BUILDING PRODUCTS

(Continued from page 122)

Merced Co.—reconstr. existing highway 1.4 mi. Rte. 4 (US 99), "G" St. to Bear Creek (portions) $300,000.
grading, surf. (wid'n.) 3.5 mi. Rte. 122 (SR 140) 0.5 mi. east to 4 mi. east of Gustine, $150,000.
grading, surf. (wid'n.) Rte. 122 (SR 140) west of Lincoln Road to west city limits of Merced (portions) $550,000.
Modoc Co.—surf. Rte. 28, 73 (US 395) Alturas to Oregon State Line (portions) $725,000.
Mono Co.—surf. 21.7 mi. Rte. 40, U.S. 395 to Nevada State Line, $275,000.
grading, surf. (reconstr.) 4.8 mi. Rte. 96, Bridgeport to Walker River Reservoir, $200,000.
Monterey Co.—grading, surf., structures for 4-lane freeway 1.3 mi. Rte. 2 (US 101) through Chualar, $620,000.
grading, surf., structure for 4-lane expressway 5.6 mi. Rte. 2 (US 101) 1 mi. north of Greenfield to Salinas River near Soledad, $1,090,000.
grading, surf., structures for 4-lane expressway 7.9 mi. Rte. 2 (US 101) 1.8 mi. north of Salinas River to 2 mi. south of Greenfield, $1,600,000.
cribbing (reconstr. retaining walls) Rte. 56 (SR 1) San Luis Obispo County Line to Rocky Creek (portions), $230,000.
surf. Rte. 119 (SR 25) SR 198 to San Benito County Line (portions), $70,000.
Napa Co.—grading, surf. (addnl. 2 lanes for 4-lane expressway) 2.3 mi. Rte. 49 (SR 29), Union Station to Orchard Ave., $525,000.
Nevada Co.—detour for future 4-lane freeway Rte. 38 (US 40) Boca to Floriston (portions) $350,000.
Nevada and Placer Counties—grading, surf., structures (wid'n.) 9.4 mi. Rte. 38 (SR 89) 0.2 mi. south of Squaw Valley Road to Truckee Wye, $1,450,000.
Orange and San Diego Counties—grading, paving and structure for 6-lane freeway 2.4 mi. Rte. 2 (US 101) San Diego Freeway-San Mateo Creek to 0.1 mi. south of Avenida Cadiz (San Clemente), $2,725,000.
Orange Co.—grading, paving, structures for 4-lane freeway 3.6 mi. Rte. 2 (US 101) San Diego Freeway, 1.9 mi. south of SR 74 (at San Juan Capistrano) to 0.1 mi. south of Trabuco Creek, $3,470,000.
grading, paving, structures for 4-lane freeway 3.8 mi. Rte. 175 (SR 14) from Santa Ana Freeway to 0.2 mi. east of Spadra Road in Fullerton, $2,900,000.
grading, surf. (wid'n. existing highway to 4-lanes) 3.8 mi. Rte. 179 (SR 22) Knott Street to Century Boulevard, $400,000.
Placer Co.—detour for future 4-lane freeway, Rte. 37 (US 40) near Magra to 0.1 mi. west of Alta Road (portions) $300,000.
Placer and Nevada Counties—grading, surf., structures for 4-lane freeway 5/7 mi. Rte. 37 (US 40), Hampshire Rocks to Soda Springs, $3,100,000.
Plumas Co.—grading, surf. 5.2 mi. Rte. 21 (US 40 Alt.) 0.7 mi. west of Spring Garden to Sloat, $1,300,000.
Riverside Co.—lighting, signing and speed-change lanes Rte. 19, 78 (US 60, 395), US 60-395 separation, $50,000.
grading, surf., structures for 4-lane freeway 4.3 mi. Rte. 19 (US 60) 4 mi. west of US 70-99 to US 70-99 (near Beaumont), $1,150,000.
grading, surf., structure 3.7 mi. Rte. 43 (US 91) SR 18, Van Buren St. to Arlington Ave., $2,850,000.
Riverside and San Bernardino Counties—grading, surf., (wid'n.) 11.3 mi. Rte. 187 US 60-70-99 to Morengo Valley, $270,000.
San Benito Co.—grading, surf. (realignment) 4.6 mi. Rte. 119 (SR 25) 5 mi. north of San Benito River to Paicines, $450,000.
San Bernardino Co.—grading, surf., structures for 4-lane freeway 29.4 mi. Rte. 31, 58 (US 66-91), Victorville to Barstow, $5,200,000.
grading, surf. (wid'n. and some realignment) 23.9 mi. Rte. 43 (SR 18) 1 mi. south of Forest Boundary to Apple Valley, $440,000.
grading, surf., structures 11.6 mi. Rte. 43, 31, (US 66-91-395) 6 St. to Devore, $7,300,000.
grading, surf. (wid'n.) 28.2 mi. Rte. 58 (US 466) Kern County Line to Hinkley (portions) $420,000.
San Diego Co.—grading, paving, structures 5.2 mi. Rte. 2 (US 101) 0.7 mi. south of Dairy Mart Road to south city limits of Chula Vista (portions) $910,000.
grading, paving, structures (Washington St.-Interchange) 1.1 mi. Rte. 2 (US 101) 0.6 mi. south of Washington St. to Garnett Ave., $1,340,000.
grading, paving, structures (convert 4-lane expressway to full freeway) 2.4 mi. Rte. 12, 77 (US 80, 395) 1.2 mi. east of Taylor St. to 0.2 mi. east of U. S. 395, $3,100,000.
grading, paving, structures (Fairmont Ave. Interchange) 0.19 mi. Rte. 12 (US 80) 0.3 mi. west to 0.6 mi. east of Fairmount Ave., $1,700,000.
grading, paving, structures for 6-lane freeway 1.7 mi. Rte. 20 (SR 94) 17 St. to Home Ave., $4,065,000.
San Francisco Co.—grading, paving, structures for 6-lane freeway 1 mi. US 2 (US 101) Central Freeway-South Van Ness Ave. to Turk St., $5,200,000.
grading, paving, structures for 8-lane freeway 1.3 mi. Rte. 2 (US 101) Lyon St. to SR 1 connection, $3,900,000.
San Joaquin Co.—grading, surf., structures (wid'n. existing highway to 4-lanes, incl. East Tracy Overhead and channelization at Christman Rd.) 3.9 mi. Rte. 5 (US 50) East City Limits of Tracy to Grant Line Road, $1,100,000.
grading, surf., structures (wid'n. existing highway to 4-lanes) 5 mi. Rte. 5 (US 50) Richards Ave. to Charter Way, $1,100,000.
reconstr. Rte. 75 (SR 4) U.S. 99 to Knights Ferry Road (portions) $20,000.
San Luis Obispo Co.—resurf. 3.2 mi. Rte. 2 (US 101) 0.2 mi. south of Camp Fremont to Cuesta Overhead, $500,000.
San Luis Obispo and Santa Barbara Counties—grading, surf., structures (relocation around Vaquero Reservoir) 7.8 mi. Rte. 57 (SR 166) 1 mi. west of Huasna River to 0.7 mi. west of Buckhorn Creek, $1,165,000.
San Mateo Co.—grading, surf. (wid'n.) 2.9 mi. Rte. 2 (US 101) El Camino Real-31 Ave. to Poplar Ave. in San Mateo, $375,000.
grading, surf. structures for 4-lane expressway 1.5 mi. Rte. 56, 55 (SR 1, 5) Edgemar to Junction Skyline Blvd. (SR 5) and Edgemar Road, $1,300,000.
Santa Barbara Co.—grading, surf., structures for 4-lane expressway 5.9 mi. Rte. 2 (US 101) Wigmore to 1.7 mi. north of Los Alamos, $1,900,000.
grading, surf., structures for 4-lane expressway 2.3 mi. Rte. 2 (US 101) 0.5 mi. west of Refugio to Tajiguas, $769,000.
Santa Clara Co.—grading, surf. (wid'n. to 4-lanes) 3.8 mi. Rte. 2 (US 101) El Camino Real-San Tomas Aquino Creek in Santa Clara to Route 114 (Saratoga Rd.) in Sunnyvale, $945,000.
grading, paving, structures for 4-lane freeway 8.8 mi. Rte. 5, 42 (SR 17) Route 42 (Santa Cruz Ave.) in Los Gatos to Bascom Ave. in San Jose, on SR 17 and Tait Ave. to new SR 17 in Los Gatos, $5,770,000.
reconstr., resurf. 2.3 mi. Rte. 32 (SR 152) San Felipe Road to Hollister Wye, $90,000.
grading, paving, structures for 6-lane freeway 1.1 mi. Rte. 68 (US 101 Bypass) Bayshore Freeway-Stevens Creek to Ellis St., $1,100,000.
Santa Cruz Co.—grading, paving, structures 4-lane freeway 2.2 mi. Rte. 56, 5 (SR 1, 17) 0.3 mi. east of Morrissey Ave. to 0.6 mi. north of SR 1-SR 17 Junction, $1,600,000.
grading, surf. 2.6 mi. Rte. 56 (SR 1) 0.2 mi. east of Swift St. to Wilder Creek, $415,000.
grading, surf., structures (wid'n.) 5.9 mi. Rte. 116 (SR 9) Felton to Boulder Creek (portions) $400,000.
Shasta Co.—grading, surf. structures (frontage roads) 3.3 mi. Rte. 3 (US 99) Clear Creek to Redding Underpass, $365,000.
grading, surf., structures (extn. of 4-lane freeway in Sacramento Canyon) 6.9 mi. Rte. 3 (US 99) 0.5 mi. north of Lamoine to 0.8 mi. north of Shotgun Creek, $4,520,000.
grading, surf. 2 mi. Rte. 3 (US 99) Cypress Ave. to Sulphur Creek in Redding, $190,000.
Sierra Co.—grading, surf. (wid'n.) Rte. 25 (SR 49) North Fork Yuba River to 0.25 mi. east of Ramshorn Creek (portions) $200,000.
Siskiyou Co.—surf. 7.6 mi. Rte 3 (US 99) Shasta River to Gazelle, $160,000.
grading, surf. (realignment) 0.9 mi. Rte. 46 (SR 96) 4.5 mi. to 5.4 mi. east of Hamburg, $125,000.
Solano Co.—grading, paving, structures for 6-lane freeway 3.5 mi. Rte. 7 (US 40) 0.2 mi. north of Vallejo Wye to 0.4 mi. north of Redwood St., $4,300,000.
grading, surf., structures 5 mi. Rte. 90, Vacaville-Dunnigan Cutoff 0.3 mi. north of Sweeney Creek to Yolo County Line, $1,070,000.

(Continued on page 127)

ROCKFORD

NEW ON THE JOB RECORDS

*TRADE MARK

Every day, earth mover, truck, tractor, grader, shovel, crane, dozer, oil field and power unit operators are establishing NEW on-the-job RECORDS with MORLIFE* CLUTCH equipped machines. They report more continuous hours of heavy-duty, off-highway work, with fewer clutch adjustments, than ever before. Some of the latest records will be featured in the Rockford Clutch booth at the Road Show in Chicago.

"MORLIFE clutch has gone 851 hours without slipping or adjustment."

"MORLIFE clutch going strong after 1695 hours, working in sand."

"MORLIFE clutches last 950 hours longer, without adjustment."

"MORLIFE clutch needs adjustment once a month, instead of daily."

"MORLIFE requires lighter handle pull and one tenth the adjustments."

"MORLIFE pulls harder and lasts six to ten times longer."

"Won't buy a unit that isn't equipped with Durable MORLIFE clutch."

New MORLIFE* CLUTCHES and CLUTCH PLATES Give-

MORE Clutch Life (400% MORE)
MORE Torque Capacity (100% MORE)
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MEDINA, OHIO's new million-dollar senior high school is protected by Vitrified Clay Pipe sanitary and storm sewers. It's a typical modern school building, with a typical modern sewerage system . . . built for permanence, and guarded by the only pipe that *never wears out.*

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Clay Pipe is the one material you can depend upon to outlast the life of the building. Chemical action can't corrode it. The ravages of time can't weaken it. Generations of constant use can't wear it out. Wherever public health is at stake, it pays to specify *permanent* Vitrified Clay Pipe.

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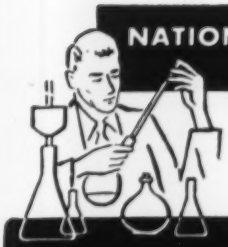

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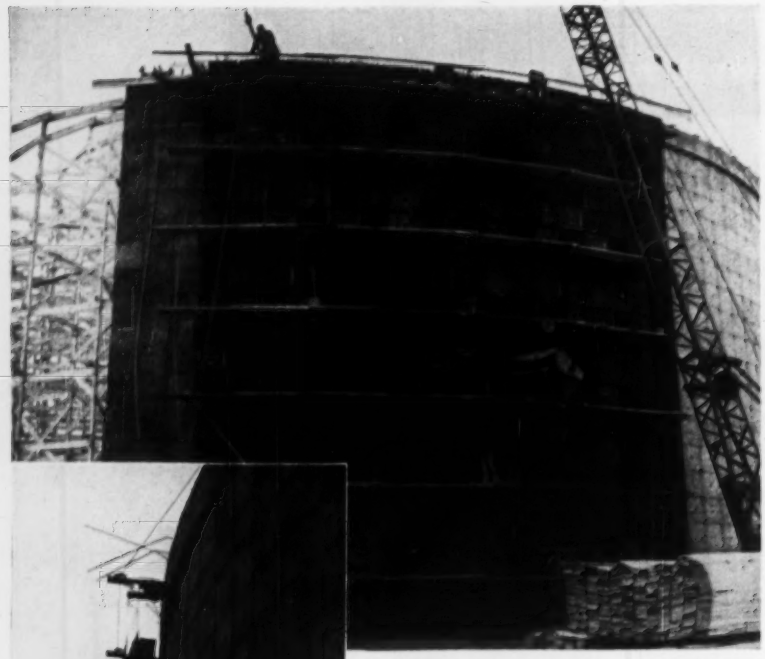
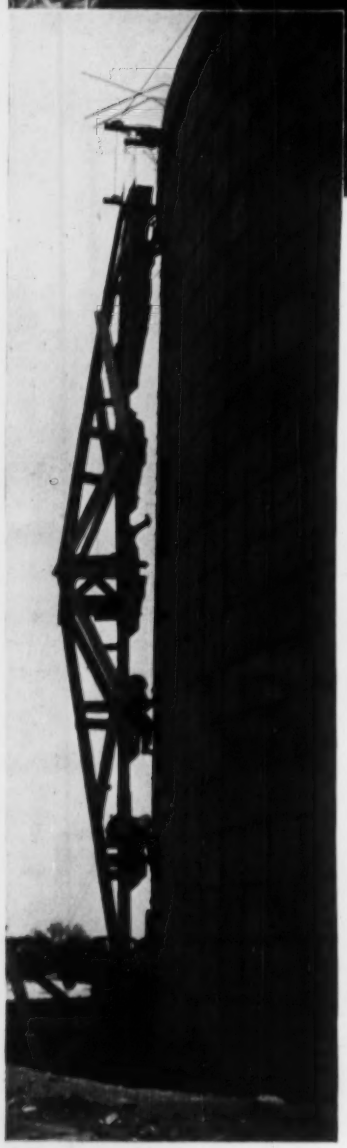


NO HORIZONTAL JOINTS: 30" sq. steel form pans were set to full height in segments of 1/9 of wall. Omitting pans left pouring windows, easily closed when concrete level reached them. Preload Construction Corp., N. Y., contractor.
Construction Methods Photos



5 MEN ON ROLLING TRUSS removed form ties before prestressing operation.

WIRES WOUND 40 STRANDS PER FT. and, at the base, several layers deep, carry 105,000 psi working circumferential stress. Layers were grout bonded and sealed. Previously, vertical prestressing of 140,000 psi was done by wires placed before pouring.

CONTINUOUS POUR of 125' dia. foundations and floors (540 cu. yds. per tank) avoided joints.

17" thin concrete, prestressed both ways,

walls 5 million gallon tanks

TWO TANKS, each 125' in diameter with a liquid depth of 54', were built for Philadelphia Suburban Water Co., North Wayne, Pa., with an estimated saving of 300,000 lbs. of reinforcing steel. With both vertical and circumferential prestressing, instead of heavy reinforced construction, walls are only 17" thick, domed with 2½" thick concrete air-placed around wire mesh.

The workable high strength concrete needed (a mix of 5½" slump developing 5400 psi in 28 days) was processed and delivered on carefully set schedule by truck mixers of certified design, capacity, mixing speed and accuracy of water control.

You have a right to insist on this Rating Plate. It certifies compliance with the high industry standards maintained for your protection by the Truck Mixer Manufacturers Bureau.

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WILLARD CONCRETE MACHINERY CO., LTD.
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WORTHINGTON CORPORATION
Plainfield, N. J.

(Continued from page 124)

Sonoma Co.—wid'n., channelizing 2.3 mi. Rte. 51 (SR 12) US 101 and 0.17 mi. east of Farmer's Lane, $435,000.

Stanislaus Co.—grading, paving, structures for 4-lane freeway 2.2 mi. Rte. 4 (US 99) Modesto Freeway-Whitmore Rd. to Pecos Ave., $1,300,000.

Sutter Co.—surf. Rte. 15 (SR 20) East end Sutter By-pass to US 40 Alt. (portions) $235,000.

surf. and wid'n. structures Rte. 87 (US 40 Alt.) Knights Landing to Onstott Road (portions) $700,000.

Tehama Co.—grading, surf. structure 5.2 mi. Rte. 29 (SR 36) 1.5 mi. east of Lassen Camp to Mineral, $980,000.

grading, surf. (realignment) 6.2 mi. Rte. 29 (SR 36) 3 mi. east of Tedoc Road to Dry Creek, $775,000.

Tulare Co.—grading, surf. for 4-lane divided highway 4.3 mi. Rte. 10 (SR 198) County Road 80 to Mooney Blvd., $1,100,000.

Tuolumne Co.—grading, surf. 8.1 mi. Rte. 13 (SR 49, 108, 120) 7 mi. east of Stanislaus County Line to Montezuma Road, $1,500,000.

Ventura Co.—grading, paving, structures for 4 and 6-lane freeway 4.8 mi. Rte. 2 (US 101) Ventura Freeway-Conjeo Grade Summit to 5 St. in Camarillo, $3,400,000.

grading, surf., structures (realignment) 0.4 mi. Rte. 151 (SR 150) 0.1 mi. west of Sisar Creek to 0.1 mi. east of Santa Paula Creek, $215,000.

Yolo Co.—reconstr. 9.1 mi. Rte. 6 (SR 128) Solano County Line to Route 90 at Winters (portions) $250,000.

grading, surf. (wid'n. and some realignment) 3 mi. Rte. 50 (SR 16-24) east side of Yolo Bypass to near Kiesel, $300,000.

grading, surf. (wid'n) 2.2 mi. Rte. 50 (SR 16-24) Bryte to Broderick, $110,000.

grading, surf. structures 13.9 mi. Rte. 90, 6, Vacaville-Dunnigan Cutoff-Solano County Line to 2.75 mi. north of Madison, $3,000,000.

Yuba Co.—grading, surf. (realignment) 1 mi. Rte. 15 (SR 20) westerly approach to Parks Bar Bridge, $100,000.

O., Amberly Village—Kopf & Kopf, Inc., 825 Delta Ave., Cincinnati, install concrete street, sewer, water lines for new sub at corner of Gailbraith Ave. and Ridge Rd., $250,000. Ed. Niemeier, 3818 North Bend Rd., Cincinnati, consult. engr. Walter Kopf, c/o owner engr.

OKLAHOMA—State Hy. Dpt., Capitol, Oklahoma City, Zone 5,

Atoka Co.—grade, drainage 21.2 mi. State Hy. 43, at Stringtown. $175,000.

Creek Co.—grade, drainage 19.2 mi. State Hy 48 at Bristow. $190,000.

LeFlore Co.—surfacing 5.7 mi. State Hy. 120, at Cameron. $90,000.

Texas Co.—surfacing 13.4 mi. State Hy. 134 at Guymon. $110,000. G. H. Bittle, c/o owner, engr.

▲ **Tex., Houston**—City, City Hall,

Griggs and Evergreen Sts., asph. paving portions, $160,000.

Hardy and Elysian Sts., widening from Lorrain into the North Loop Freeway, $328,000.

Holman St., widening a portion, $90,000.

N. MacGregor St., asph. paving halfway around the southern perimeter, $110,000.

San Felipe and S. Post Oak Sts., asph. paving portions, $155,000.

Studewood St., asph. paving, south from White Oak to Washington Sts., $141,000.

York St., widening and paving from Harrisburg into Gulf Freeway, $100,000.

Thoroughfare connection across Buffalo Bayou, for moving north-south traffic, $450,000. Frank Baldwin, Direc. P. Wks. Engr. CD 1/9/56.

Tex., Kenedy—City, bond election Nov. 6, imprv. sections of streets, $145,000.

Tex., Mesquite—Big Town Co., c/o Wes Fenton, 1006 Davis Bldg., Dallas (Gerri von Frellick, 300 Equitable Bldg., Denver, Colo.—developer), plans by Tatium & Quade, 2812 Fairmount St., Dallas, 3,500 auto hard paved parking center and area paving, $200,000. Shrewsbury-Tharaldson Assocs., 216 S. Central St., Glendale, Calif., designers. CD 5/4.

EARTHWORK, WATERWAYS

Illinois—Illinois Dpt. Conservation, Glenn D. Palmer, dir., Springfield, conservation lake to about 40 ft. deep and 5 mi. long on Richland Creek near Shelbyville. 2,000 acres site recreational purposes. $345,000. CD 8/14/44.

PUBLIC BUILDINGS

Calif., El Camino—WAREHOUSE—El Camino Jr. College, Crenshaw and Redondo Blvd., Los Angeles, plans by Smith, Powell & Morgridge, 208 W. 8th St., Los Angeles, 1 story, type 3 maintenance and warehouse bldg., 22,000 sq. ft. $100,000.

Calif., Freedom—SCHOOL—Freedom Union Elementary School Dist., c/o Supt. P. O. Box 408, bond election Nov. 20 school. $350,000.

Calif., Lenore—SCHOOL—Island-San Jose Union Elem. School Dist., Rt. 2 Box 130 A, application for state aid loans approved for elementary school, Island-San Jose Elem. School, $397,550. Bowen, Rule & Bowen, 8235 Gilroy St., Los Angeles, consult. engrs. CD 7/25.

Ind., Carmel—SCHOOL—Bd. Trustees Clay Twp., R. R. No. 1, plans by Vonnegut, Wright & Porteous, Inc., 1537 Central Ave., Indianapolis, 2 story, 67x225 ft., masonry, concrete, steel school. $344,000. J. M. Rotz Co., 1919 N. Meridian St., Indianapolis, consult. engr. CD 2/24/55.

Kan., RFD from Kansas City—SCHOOL—Oak Grove School Dist. No. 34, Oak Grove and Key Rds., RFD from Kansas City, plans by Frangkiser & Hutchens, 7926

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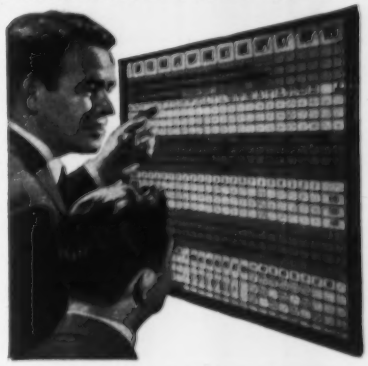

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State Line, Kansas City, Mo., elementary school. $375,000.

Minn., Mazeppa—SCHOOL—Bd. Educ., F. G. Einermann, supt., constr. school, $350,000.

Mo., Norborne—SCHOOL—Bd. Educ., voted $350,000 bonds Oct. 15, elementary school. H. A. Scharhag, 1103 E. Armour St., Kansas City, Mo., archt.

Mo., Warrensburg—DORMITORY—Central Missouri State College, Warrensburg, plans by Everitt & Keleti, 4530 Main St., Kansas City, Mo., 4 story, 45x250 ft. rein.-con. women's dormitory, $400,000. (Correction-architect's name and address). CD 9/7.

COMMERCIAL BUILDINGS

Calif., La Sierra—DWEELINGS—Tietz Constr. Co., 11611 Brookhurst St., Garden Grove, 26 frame, stucco dwellings, 1,544 sq. ft., 11295 Royal Palm Blvd., lots 7-39, Skylark terr. composition roof. $357,288.

Conn., Bloomfield—PARISH HOUSE—Bloomfield Federated Church, Tunxis Ave., parish house, $345,000.

Conn., Norwalk—EDUCATIONAL—Norwalk Methodist Church, 724 West Ave., plans by Jesse J. Hamblin, 1188 Main St., Bridgeport, educational bldg., Norwalk Methodist Church to accommodate 600, $350,000. CD 9/11.

Conn., Thompsonville—SCHOOL—St. Adalbert's Parish, Thompsonville, plans by Olson & Miller, 742 Asylum Ave., Hartford, red brick, limestone, cantilevered roof section, school, 9 classrooms, auditorium. $350,000.

Ill., Jacksonville—DORMITORY—Illinois College, Jacksonville, plans by Mittelbusher & Tourtelot, 36 S. State St., Chicago, dormitory. $344,000. CD 7/19/44.

Ind., New Albany—CHURCH—St. Marks Evangelical & Reformed Church, E. 3 and E. Spring Sts., plans by Walker, Applegate, Oaks & Assocs., 218 Elsby Bldg., 57x130 ft., masonry, rein.-con., structural steel church. $345,000.

Iowa, Council Bluffs—CHURCH—Broadway Methodist Church, Carl Beason, chm. Bldg. Com., 11 S. 1 St., plans by Thorson, Thorson & Madson, 217 Waterloo Blvd., Waterloo, Iowa, church addn. $350,000.

Kan., Salina—APARTMENT—Kansas Wesleyan University, Salina, plans by Wilson & Co., engrs.-archts., 705 E. Crawford St., two apartments. $344,000. CD 10/18.

Mass., Framingham—TELEPHONE—New England Telephone Co., 185 Franklin St., Boston, telephone bldg., $345,000. Constr. 1957-1958.

Mass., Pembroke—HOUSES—Brauer Constr. Co., Inc., 10 Bellaire Rd., West Roxbury, residential development, plans by Ralph Lee Rankin, Pinecrest Ave., 20-25 houses, High St. $345,000.

Mass., Shrewsbury—CHURCH—Fairlawn Baptist Church, c/o Doak Martin, archt., 8 Norwich St., Worcester, 2 story, 40x76 ft. church addn. $360,000. Constr. 1957.

Mass., Wayland—SHOPPING CENTER—Edward A. Veno, State Rd., plans by Tekton Assoc., Inc., 23 Washington St., Natick shopping center, 10 stores, supermarket, 8,000 sq. ft. parking space, $350,000.

Mich., Albion—CHURCH—St. Paul's Lutheran Church, Albion, church, Orchard Dr. $350,000.

N. J., Atlantic City—MOTEL, etc.—Paul Lustgarten & Assocs., c/o Myer Saul, Inc., 2300 Pacific Ave., motel and boardwalk, Rhode Island Ave. $344,000.

N. J., Montclair—CHURCH—Archdiocese of Paterson and Parish of Immaculate Conception, Cottage Place, Montclair, plans by Kruger & Fava, 11 Hill St., Newark, church school addn. Cottage Pl. $350,000.

N. Y., Orangeburg—TELEPHONE EXCHANGE—New York Telephone Co., 140 West St., 2 story telephone exchange bldg., $344,000.

N. Y., Rome—CHURCH, etc.—St. Paul's Church, Bedford St., church and rectory. $344,000, Harold G. Rice, 157 W. Dominick St., consult. engr.

Pa., Swarthmore—STORES, etc.—Pup-A-Go., 631 S. Chester Rd., stores and offices (expansion of theatre square project). $344,000.

Tex., Houston—AUDITORIUM, etc.—University of St. Thomas, c/o Philip C. Johnson, 219 E. 44 St., New York, N. Y., and Bolton & Barnstone, 811 Lovett Blvd., Houston, auditorium and classroom unit, steel frame, brick exterior. $400,000.

Tex., Lubbock—SHOPPING CENTER—Ray W. Pace, Tom Cherry, & E&R Lumber Co., 2726 Texas Ave., shopping center (in area planned for 600 dwellings costing $11,000,000), $400,000.

Tex., San Antonio—DWELLINGS—Quincy Lee Constr. Co., 211 Olmos Dr. West, 36 dwellings, $370,000; 30 dwellings, $359,700.

Tex., Waxahachie—SANCTUARY—First Baptist Church, c/o pastor, plans by Easterwood & Easterwood, 522 N. P. Anderson Bldg., Ft. Worth, 1 story sanctuary, and 3 story educ. bldg., brick, tile, concrete steel, air-conditioned. $335,000. Bids soon.

Wis., Eau Claire—OFFICE—Northern States Power Co., 2 S. Barstow St., plans by Larson & Playter, 401 S. Barstow St., 2 story, bsmnt. office. $350,000.

Wis., Milwaukee—CHURCH—Lutheran Church of Reformation, 2201 N. 35 St., plans by A. H. Siewert, 2716 W. North Ave., church remodeling, addn. $365,000.

INDUSTRIAL BUILDINGS

N. J., Totowa—PLANT—Kaysam Corp. of America, 27 Kenlak Ave., Paterson, 40,000 sq. ft. plant for design and manufacture meteorological balloons to consolidate and combine operations now at Hackensack and Paterson into one plant on Shephards Lane. $400,000.

O., Bedford Heights—PLANT—Thompson Electric Co., 1111 Power Ave., Cleveland, plans by Dalton & Dalton, The Arcade, Cleveland, plant Richmond Rd. near old Bedford Airport, $250,000.

Okla., Hugo—DIAL TELEPHONE EXCHANGE—Southwestern Telephone Co., 405 N. Broadway, Oklahoma City, dial telephone exchange bldg. $175,000. Jas. Tipton, Hugo, engr.

Pa., Carnegie—LABORATORY—O. Hommel Co., Maple St., plans by Bowers & Barbalat, Bakewell Bldg., Pittsburgh, 2 story, 80x120 ft., block, porcelain enamel research laboratory, Scott Twp. $200,000. CD 1/29/45.

S. C. Andrews—PLANT—Orefraction Minerals Inc., 7500 Thomas St., Pittsburgh, Pa., grinding and processing plant. $300,000. Dotterer Eng. Co., 12 Exchange St., Charleston, consult. engr.

UNCLASSIFIED

Conn., New Haven—HARBOR DEVELOPMENT—City, City Hall, developing harbor front, land filling, bulkhead, park, heliport, $350,000. Wm. Bolton, city engr.

Kansas and Oklahoma—RURAL TELEPHONE LINES—Harper Co. Rural Telephone Assoc., E. J. Salter, mgr., Anthony, rural telephone lines and services in Sumner Co., Kan., and Grant and Kay Co., Okla., KAS-5448. $257,000.

Me., Rockland—TERMINAL—Bd. City Contrs., Town Hall, port terminal, off Rockland Harbor. $200,000. Fay Spofford & Thorndike, 11 Beacon St., Boston, Mass., engrs. CD 4/1/52.

Mass., Tewksbury—LAUNDRY—Commonwealth of Mass., Dpt. P. Welfare, c/o Div. Bldg. Constr., 38 Chauncy St., Boston, C-57-2 laundry, $440,000. William W. Drummey, 80 Boylston St., Boston, consult. engr.

Mich., Harper Woods—PARKS—City, Marie T. Baron, clk., 8 neighborhood parks development, $450,000.

N. J., Newark—LIGHT SYSTEM—City, City Hall, Broad St., installing addnl. traffic light sys. at intersections. $285,000. Edward L. Cyr, City Hall, consult. engr.

Tex., Corpus Christi—GAS DISTRIBUTION LINES—Reynolds Sales Co., c/o Fred Wakefield, Gregory, 20 mi. 10 in. gas lines in Corpus Christi Bay and Oso Bay. $200,000.

Tex., Dallas—GARDEN CENTER BLDG.—City, Parks Dpt., City Hall, Garden Center Building in Fair Park. $200,000. CD 2/8.

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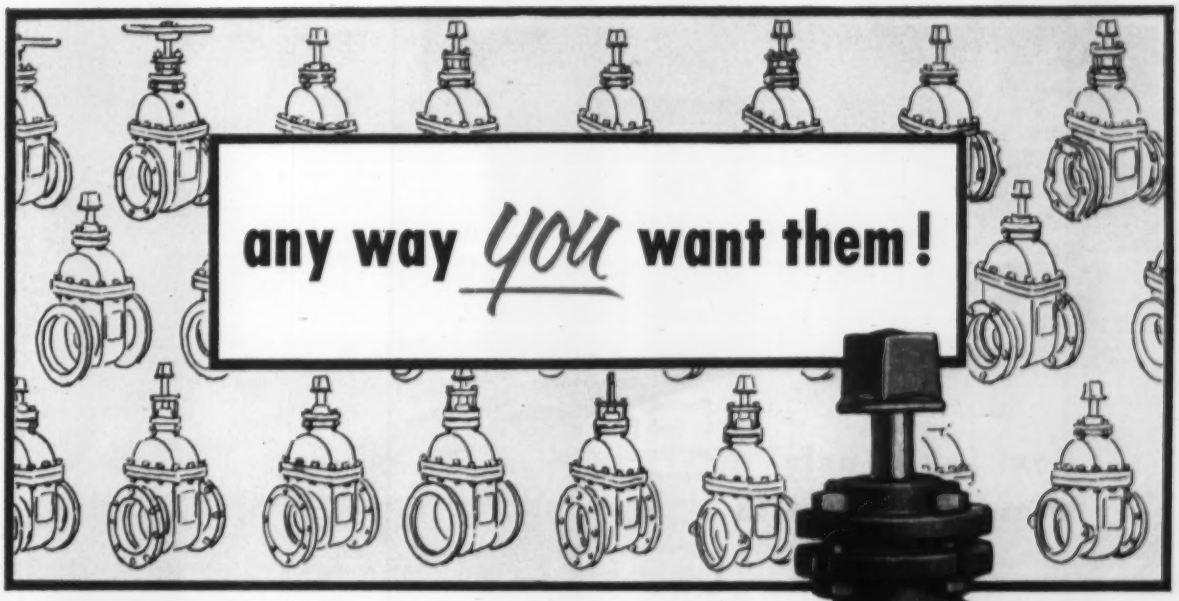

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This mobility on rubber is the answer to all those widely-scattered, small yardage trenching jobs where you formerly had to bring in cumbersome, oversize equipment, or use slow, costly hand labor. Trenchmobile is big enough, too, for a lot of main-line excavations. You get trench widths from 8 to 16 inches . . . depths to 5 feet, for water and gas mains, service connections, pipe reclamation, foundation footings, underground cables, lighting systems.

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HOLDS ACCURATE GRADE . . . Positive down-crowd on the digging boom starts cut fast, maintains accurate grade. Buckets are high-carbon cast steel. Self-sharpening, easy-in-easy-out "Tap-In" teeth assure top digging efficiency at every width and depth, in all types of soil and job conditions.

BACKFILLS ITS OWN TRENCH . . . Backfill blade (optional) doubles usefulness of the Parsons Trenchmobile . . . lets you do the entire job of trenching and backfilling with one-man, one-machine economy. The husky six foot blade is readily adjustable from straight bulldozing to angled position . . . is raised and lowered by hydraulic control.

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DODGES SIDE OBSTRUCTIONS . . . Shiftable, reversible belt conveyor places spoil bank on either side of trench . . . lets Parsons Trenchmobile work in close to buildings, poles, without swerving from grade line.

UNDERCUTS SIDEWALKS . . . With reverse traction and sloping ladder boom, Trenchmobile undercuts walks, curbs, gutters, old mains . . . makes vertical cut-line, flush against foundation walls. Saves hand work. Hinged crumber swings up, out of the way.

Get 3-tool versatility with Kwik-Mix Moto-Bug®

Big R-15 Moto-Bug hauls all kinds of bulk materials in 15 or 18-cubic foot hopper body. Hopper is quickly interchanged wtih 1-ton capacity platform, or ¾-ton (7-foot) fork lift. There's no limit to its usefulness — earns big savings in time and costs. Ask, too, about smaller S-10 Moto-Bug, available with multiple attachments. Kwik-Mix line also includes concrete mixers, plaster-mortar mixers, bituminous mixers — all sizes and types.

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Central cement feed prevents "gumming"

With concentric arrangement of aggregates around cement in the Johnson Concentric Batcher, all ingredients are intermingled as they flow through discharge. Reduces dusting, pre-shrinks materials. Cement is weighed individually on precision-beam scale; aggregates on accumulative dial scale or individual beam scales. Johnson Concentric Batcher sizes: 2 to 8 cu. yds., arranged for 2 to 8 aggregates, 1 to 4 types of cement.

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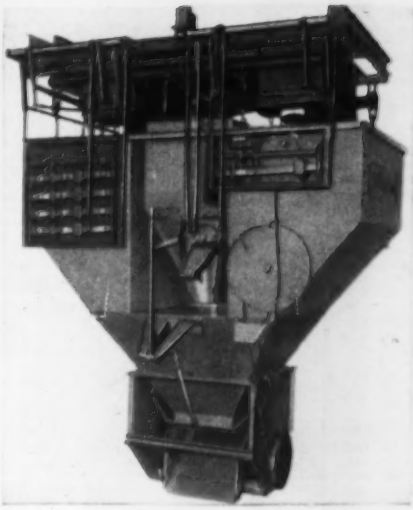

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BRIDGES

November 13 Connecticut

STREETS AND ROADS

November 13 Connecticut November 14 Massachusetts

BUILDINGS—BA

▲ **Mass., Northampton**—ADMISSION TREATMENT—BA 11/16—State, Dpt. Mental Health, Div. Bldg. Constr., 38 Chauncy St., Boston, M-718, 3 story, brick, masonry admission treatment bldg., State Hospital. $1,808,000. Plans deposit $100, refundable. Perley F. Gilbert & Assoc., Inc., Sun Bldg., Lowell, Mass., archt. CD 2/11/55.

BUILDINGS—SLC

▲ **Wadhams & May Co.**, 5 Lewis St., Hartford, Conn., LB $2,068,581. Orvill H. Platt HIGH SCHOOL, MERIDEN, CONN. City Bd. Educ., 22 Liberty St., Meriden, Conn. Bids Oct. 29. CD 10/3

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

November 13 Maryland

HEAVY CONSTRUCTION—LB & CA

▲† **Great Lakes Dredge & Dock Co.**, Morgan Bldg., Buffalo, N. Y. CA $3,487,075. dredging the downstream approach channel to Grasse Lock, portion of St. Lawrence River between Massena Point and Cornwall Island, southwest of Polleys Gut and 7 mi. east, northeast of Massena, for St. Lawrence Seaway Development Corp., NEW YORK, U. S. Eng., Engineer Park, Niagara and Bridges Sts., Buffalo 7, N. Y. CD 10/18, under LB.

▲ **Zara Contg. Co., Inc.**, Engel St., Hicksville, N. Y. CA $2,584,623. lateral sewers at Baldwin and vicinity, town of Hempstead, Sewage Collection Dist. 2-B, Contr. No. 1002-2-B-4, MINEOLA, N. Y. County Exec., Nassau Co., Old County Court House, Mineola, N. Y. CD 10/8, under LB.

▲ **A. E. Ottaviano, Inc.**, 80 Brook St., Croton-on-Hudson, N. Y. LB $1,647,476. (4 bidders) Contr. No. 820 north bound roadway wid'n. existing bridges and appurtenant work on Saw Mill River Parkway between Yonkers Ave. and Tube Wells Water Works in city of Yonkers, WHITE PLAINS, N. Y. Dpt. P. Wks., Westchester Co., County Office Bldg., White Plains, N. Y. Bids Oct. 24. CD 10/19.

▲ **Underground Constr. Co.**, 1900 Jefferson-Davis Hy Box 2115, Potomac Station, Alexandria, Va., CA, $4,873,064. Sect. 4, East Branch Piney Branch trunk sewer in Kansas Ave. and 5 St. from Varnum St. to Ingraham St. N. W., WASH., D. C. D. C. Govt. Dpt. Sanitary Eng., 499 Pennsylvania Ave. N. W., Wash., D. C. Bids Sept. 19. CD 9/25, under LB.

BUILDINGS—LB & CA

▲ **DiLido Homes**, c/o Seelig & Finkelstein, archts., 153 Pierrepont St., Brooklyn 2, N. Y. Owner Builds. $9,500,000. 400 HOUSES on tract at East 87 St., and Ave. M, BROOKLYN, N. Y.

▲ **Parkside Manor Homes**, c/o Kavy & Kavovitt, archts., 44 Court St., Brooklyn 2, N. Y. Owner Builds. $9,500,000. 550 HOUSES on site bounded by Ave. M., Seaview Ave., E. 80 and E. 88 Sts., BROOKLYN, N. Y.

▲ **George F. Driscoll Co.**, 41 E. 42 St., New York 17, N. Y. CA Est. $8,000,000. 11 story foundling HOSPITAL, 1175-1185 Third Ave. between 68 and 69 Sts., NEW YORK, N. Y. New York Foundling Hospital, 175 E. 68 St., New York 21, N. Y. Bids Oct. 25. CD 10/2.

▲ **North Country Shopping Center**, c/o Jerome Lieberthal, Chrysler Bldg., New York 17, N. Y. Owner Builds. $6,250,000. 500 HOUSES (National Homes) on Cumberland Head, near PLATTSBURGH, N. Y.

▲ **Arnold Kramer & S. Yarosh**, Rte. 36 and Garden State Parkway, South River, N. J., Owner Builds, $8,350,000. 678 HOUSES, Union Ave. in Woodland Park Section, RARITAN TOWNSHIP, N. J. Rudolph Novak, 89 Central Ave., Clifton, N. J., archt.

▲ **Muscarelle Constr. Co., Inc.**, Essex St. and State Hy. No. 17, Maywood, N. J., CA $1,640,000. 2nd JUNIOR HIGH SCHOOL, TEANECK, N. J. Bd. Educ., Teaneck Twp., Teaneck, N. J. Bids Oct. 16, awarded Oct. 25. CD 10/24, under LB.

SOUTH

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

November 16 Tennessee

STREETS AND ROADS

November 16 Tennessee

BUILDINGS—BA

▲ **Ala., Montgomery**—STATE OFFICE—BA 12/20—Alabama State Bldg. Comn., State Capitol, 7 story, bsmnt., rein.-con. state office bldg. on block east of the capitol, $3,000,000. Charles J. McCauley, Jackson Blvd. Birmingham, and T. Cooper Van Antwerp, 354 St. Francis St., Mobile, archts. CD 2/14.

HEAVY CONSTRUCTION—LB & CA

▲ **VIRGINIA**—The Richmond-Petersburg Turnpike Auth., 1015 E. Main St., Richmond Zone 2,

Villa Contg. Co., Inc., 233 North Ave., Westfield, N. J. LB $2,447,634 (5 bidders). Contr. C-1-G, Sect. C, grading, drainage, paving and structures from point 1,800 ft. north of Rte. 10 to point 3,900 ft. north of Rte. 656, Chesterfield Co. Bids Oct. 30. CD 10/12.

BUILDINGS—LB & CA

▲ **General Services Admin., P. Bldgs. Serv., Regional** Office, 50 Seventh St. N. E., Atlanta, Ga., rejected bids Sept. 27, construction and leasing of Communicable DISEASE CENTER, ATLANTA, GA. LB $9,256,300 construction only; LB $11,655,000 construction and financing. CD 10/3, under LB.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

November 20 Wisconsin

STREETS AND ROADS

November 13 Ohio November 20 Wisconsin

HEAVY CONSTRUCTION—LB & CA

▲ **MICHIGAN**—State Hy. Dpt., Stevens T. Mason Bldg., Lansing,

Mich.—**Denton Constr. Co.**, 20415 Mack Ave., Grosse Pointe, Mich. and **Sugden & Sivier**, 13100 Cloverdale St., Oak Park, Mich. LB $1,714,122, est. $2,080,000. (22 bidders) dual 24 ft. c. conc. 4.562 mi. US-23 relocation from north Territorial Rd. to Grade Separation, Grand Trunk & Western R.R., M 47011 C1-RN (SP 81-62), Livingston and Washtenaw Counties;

Mich.—**L. A. Davison Co.**, 213 E. St. Joseph St., Lansing, Mich. LB $309,587, est. $360,000. (13 bidders) 22 ft. special c. conc. 1.789 mi. FAS Rte. 20 from Allen Rd. to Dix Rd., CS 82-140 C3 (S 111 4), Wayne Co.;

Mich.—**W. H. Knapp**, Monroe, Mich. LB $161,645, est. $170,000 (6 bidders) c. conc. 0.655 mi., curb and gutter, M-15 south village line, F 79031 C1-U (SP 79-24), (F 239 11), Tuscola Co.; LB $381,331, est. $370,000. c. conc., curb, gutter, b. conc. surf. 1.75 mi. M-15 and M-21, F 25083 C1-U (SP 25-16), (F 145 9), Genesee Co. Bids Oct. 24. CD 10/12 and 10/18.

BUILDINGS—LB & CA

▲ **Frank Messer & Sons, Inc.**, 4612 Paddock Rd., Cincinnati, O. LB $1,924,000. GARAGE, STORAGE DEPOT, pipe yards for Water Works Dpt., CINCINNATI, O. City, City Hall, Cincinnati, O. Bids Oct. 30.—CD 9/20.

▲ **LaSalle Constr. Co.**, 343 S. Dearborn St., Chicago, Ill., CA, $7,000,000. 375,000 sq. ft. tin and steel processing PLANT, on 25-acres, 165 and Sumner Sts., HAMMOND, IND. American Can Co., 100 Park Ave., New York, N. Y.

▲ **Gust K. Newberg Co.**, 2040 N. Ashland Ave., Chicago, Ill., CA $5,500,000. HOSPITAL addn., CHICAGO, ILL. Chicago Wesley Memorial Hospital, 250 E. Superior St., Chicago, Ill. Bids Oct. 2. CD 10/23, under LB.

▲ **Seyburn & Berry**, 18267 James Couzen St., Detroit, Mich., **Ira Spoon**, 18033 Wyoming St., Detroit, Mich., **Marshall Gootson**, 20461 Tracy St., Detroit, Mich. and 6 other builders. CA $19,000,000. First Sect. 1,000 brick HOMES, (1,000 homes per year for 5 years) Venetian Village, 13-Mile Rd., Kelly Rd., Gratiot Ave., Masonic Blvd., Evenside Dr., Grossbeck Hy., 14-Mile Rd., 1,000-acre site, ERIN-CLINTON, MICH. Merrill-Threm Co., 20602 Harper St., Detroit 36, Mich.

▲ **Norm Davidson Realty**, 205 Farnum St., Royal Oak, Mich. Owner Builds. $2,400,000, 160 brick HOMES, John R. between 11-Mile and 12-Mile Rds., MADISON HEIGHTS, MICH.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

November 13 Iowa November 15 Kansas
November 16 Minnesota, North Dakota

STREETS AND ROADS

November 13 Iowa November 15 Kansas, Texas
November 16 Minnesota, North Dakota

BUILDINGS—BA

▲ **Tex., Mission**—POWER PLANT, etc.—BA 11/19—Central Power & Light Co., 120 Chaparral St., Corpus Christi, electric power plant, initial generating capacity, 66,000 kw, $6,500,000; area earthwork, grading, $50,000; power lines, $800,000. Sargent & Lundy, 140 S. Dearborn St., Chicago, Ill., engrs. CD 10/23.

▲ **Tex., Austin**—SUPREME COURTS—BA About 12/14—State, State Building Comn., Administration Bldg., 7 story, 2 bsmnt. levels, 148,000 sq. ft. supreme court bldg. $3,000,000. Jessen, Jessen, Millhouse & Greeven, 2816 Hemphill Park, Page, Southerland & Page, 602 West Ave., Austin, and Mackie & Kamrath, 2713 Ferndale St., Houston, archts. Walter P. Moore, 2 Pinedale St., Houston and Blum & Guerrero, 1111 Neches St., Austin, engrs. CD 12/1.

HEAVY CONSTRUCTION—LB & CA

▲ **Flenniken Constr. Co.**, 5206 Maple St. and L. H **Lacy**, 5603 Yale St., Dallas, Tex., LB $4,169,429, 136-acres airport rein.-con. paving; LB $109,000, concrete ramp for terminal bldg.; LB $95,505, dual road entrance to terminal bldg.; LB $78,222, hard paved auto parking center; LB $223,314, north-south runway extens.; LB $162,000, taxiways; LB $91,215, constr. and paving roadways around ends of airport, Love Field, DALLAS, TEX City, City Hall, Dallas, Tex. Bids Oct. 29.

FAR WEST

HEAVY CONSTRUCTION—LB & CA

▲ **CALIFORNIA**—State Div. Hys., 120 S Spring St., Los Angeles,

Gordon H. Ball, 300 Camille Ave., Danville, Calif., LB $1,757,442 (5 bidders) grading 1.4 mi. 4-lane divided freeway on U. S. 91/66 near Victorville and Victorville Overhead and bridge across Mojavd River, San Bernardino Co. Bids Oct. 25. CD 10/1.

▲† **Griffith Co.**, 1060 S. Broadway, Los Angeles, Calif., LB $5,142,819, Los Angeles River Imprvts. 63 St. to below Dominguez, Los Angeles County Drainage Area, Serial No. CIVENG-04-353-57-10, CALIFORNIA U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. CD 12/17/52.

BUILDINGS—LB & CA

▲ **Cahill Brothers**, 350 Sansome St., San Francisco, Calif. Owner Builds. $2,000,000. 7 story, rein.-con. office bldg. with basement garage, Market and Pine Sts., SAN FRANCISCO, CALIF. Meyer & Evers, 268 Market St., San Francisco, Calif., archts. Standard Oil Co. of California, lessee.

CANADA

HEAVY CONSTRUCTION—LB & CA

▲ **BRITISH COLUMBIA**—B. C. Govt., Parliament Bldgs., Victoria,

Highway Constr. Co. Ltd., 836 River Rd., Lulu Island, Vancouver, B. C., CA $2,231,039. 4.62 mi. Trans-Canada Hy. in Bell Crossing-Saddle Rock Section. Awarded Oct. 24. CD 7/21/43.

▲ **Northern Constr. Co. & J. W. Stewart Ltd.**, 1304 Hornby St., Vancouver, B. C., CA $9,000,000. 2½ mi. tunnel for Bridge River hydro-electric project, Bridge No. 2 Station, Bridge River Area, BRITISH COLUMBIA. B. C. Electric Co. Ltd., 425 Carrall St., Vancouver, B. C. Awarded Oct. 25. CD 11/4/54.

BUILDINGS—LB & CA

▲ **Burns & Dutton Concrete & Constr. Co. Ltd.**, 5440 1 St. S.W., Calgary, Alta., CA $2,331,535. 8 story, bsmnt., partial sub-bsmnt. 130x150 ft., steel, concrete block, masonry, TOLL BLDG., CALGARY, ALTA. Alberta Government Telephones, 9718 107 St., Edmonton, Alta. Awarded Oct. 22;

Lockerbie & Hole Western, Ltd., 10718 101 St., Edmonton, Alta., CA, $764,263. Plumbing, heating and ventilating for toll building (Calgary, Alta.).

▲ **Fluor Corp. of Canada Ltd.**, 200 Bloor St. E., Toronto, Ont., CA $4,000,000, design and construct offsite facilities in conjunction with new reformer and crude units at REFINERY, CLARKSON, ONT. British American Oil Co. Ltd., British American Oil Bldg., Toronto, Ont.

LATIN AMERICA

BUILDINGS—LB & CA

▲ **General Electric Co.**, River Rd., Schenectady, N. Y., U. S. A. CA design and construct, ATOMIC REACTOR of nuclear research center, CARACAS, VENEZUELA. Govt. of Venezuela, Caracas, Venezuela.

U. S. POSSESSIONS

BUILDINGS—LB & CA

▲ **Theo. G. Meyer & Sons**, 200 Quint St., San Francisco, Calif., CA $21,852,338, construct and finance, 1,326 units (Capehart) HOUSING, Schofield Barracks, HONOLULU, T. H. U. S. Eng., Box 2240, Honolulu, T. H. Bids Sept. 19. CD 9/27, under LB

AMERICANS ABROAD

BUILDINGS—LB & CA

▲ **ACF Industries, Inc.**, 30 Church St., New York, N. Y., U. S. A. CA Est. $5,000,000, 30,000 kw. LIGHT WATER NUCLEAR RESEARCH and TESTING REACTOR, STUDSVIK, SWEDEN. Atomic Energy Co. of Sweden, Sweden. 11/8/56.

FOREIGN

BUILDINGS—LB & CA

▲ **Foundation Co. of Canada, Ltd.**, 1980 Sherbrooke St. W., Montreal, Que., CA Est. $14,000,000. Canada-India ATOMIC REACTOR at Trombay, near Bombay, INDIA. Atomic Energy of Canada, Ltd., Govt. of Canada, Ottawa, Ont., and Govt. of India, Delhi, India. Shawinigan Eng. Co. Ltd., 600 Dorchester St. W., Montreal, Que., engr.

(Proposal Advertisment see pp. 145 to 147)

Comes in 2½", 3" and 3½" dia.—insensitive to caps, friction, shock—non-headache-producing

WHAT IT IS—"Nitramex" No. 3's a *new* blasting agent with the power of 60% ammonia gelatin—PLUS safety advantages *you don't find in conventional explosives.* It's insensitive to caps, bullets, friction and impact of heavy weights. A powerful primer is needed to detonate it—and for maximum safety, only the special non-nitroglycerin "Nitramex" No. 3 Primer is used. Consider what this means in terms of safer loading—and handling misfired holes.

WHERE TO USE IT—"Nitramex" No. 3—designed only for large wagon-drill holes—performs best in hard-shooting formations—both wet and dry work. In wet work, you can load one day and fire the next under depths of water up to 25'.

WHY—Combined with Pelletol No. 1 it has a higher loading density than any conventional explosive—AND WITHOUT TAMPING. This means more rock per foot of hole. It's easy to handle and load. Sinks rapidly in water, WITHOUT POLING—and DOES NOT CAUSE HEADACHES. Thanks to a special coupling bail, loading moves fast.

OTHER "EXTRAS"—Use either the 2½", 3" or 3½" dia.—"Nitramex" No. 3 fits the need. And it comes in sturdy 24" fiberboard tubes with sealed metal ends that stand rough handling and abrasion.

So for maximum safety and power in tough-shooting rock—order "Nitramex" No. 3 and its Primer. Another Du Pont "team" that will pay off for you! Call our man or write: E. I. du Pont de Nemours & Co. (Inc.), Explosives Dept., Wilmington 98, Delaware.

IDEAL FOR ELECTRIC INITIATION

You can thread electric caps or Primacord through tunnel of "Nitramex" No. 3 Primer. This dependable 2" x 6" primer alone will detonate the shot,

... OR PRIMACORD INITIATION

and each end contains a handy coupling and lowering device which assures fast, efficient loading into holes. (Device shown in photo above.)

DU PONT BLASTING AGENTS

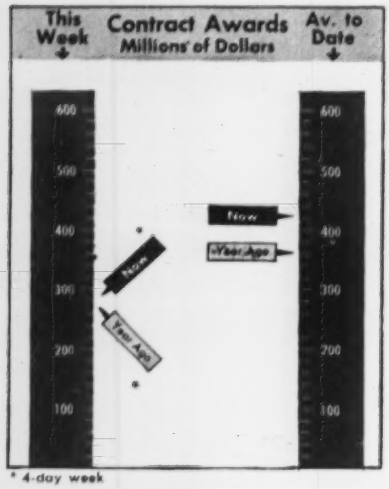
Products of Du Pont Research

DU PONT

BETTER THINGS FOR BETTER LIVING...THROUGH CHEMISTRY

Construction Scoreboard

Activity this Week



* 4-day week

AMOUNT OF CONTRACTS LET

By Ownership	This Week	Cum. 45 wks 1956	Chge %
		millions	
Federal	$15.1	$1,483.5	+0.1
State and Municipal	97.8	5,723.9	+24
Total Public	112.9	7,207.4	+18
Total Private	168.1	11,809.7	+15
U. S. Total	$281.0	$19,017.1	+17
By Type of Work			
Waterworks	$5.8	$313.5	+32
Sewerage	11.7	524.6	+53
Bridges	7.8	546.3	+29
Highways	35.8	2,172.9	+15
Earthwork, Waterways	8.3	654.7	+35
Buildings:			
Public, Excl. Housg.	36.9	1,807.0	+20
Public Housing	0.4	287.5	+20
Private Housing	31.1	4,841.1	−12
Commercial	42.2	1,678.5	+14
Industrial	41.7	4,612.6	+85
Unclassified	9.3	1,553.4	−10
U. S. Total	$281.0	$19,017.1	+17

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

NEW CAPITAL FOR CONSTRUCTION

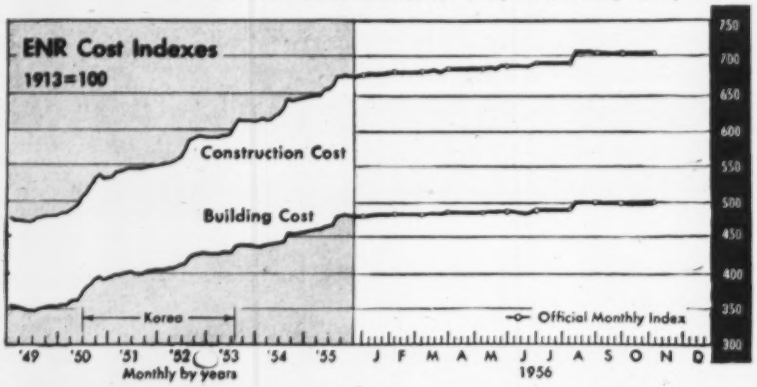
	Week of Nov. 1	Cum. 44 wks 1956	Chge '55-'56 %
		millions	
Corporate Securities	$95.4	$4,175.7	+41
State and Municipal:			
All Except Housing	184.6	4,025.3	+1
Housing	....	42.3	−50
Federal Loans	....	134.0	+15
Federal Aid	....	1,070.0	+25
Total Nonfederal	$280.1	$9,477.3	+18
Federal Appropriations:			
In U. S.	$....	$3,460.3	+2
Outside U. S.	....	15.9	−81
Total New Capital	$280.1	$12,923.5	+13

Cost Indexes as of Now

ENR INDEXES (1913 = 100), 20-cities' average	Week of Nov. 1 1956	% Change from Oct. 4 1956	Nov. 3 1955
Construction Cost	904.13*	−0.05	+4.6
Building Cost	500.48*	+0.1	+4.4

*Official Monthly Index for November.

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.850.
1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518.



WAGE RATES, 20-cities' average

	Nov. 1956†	% Change from Oct. 1956	Nov. 1955
Common	$2.192	0	+4.7
Skilled (average 3 trades)	3.433	+0.3	+4.4
Bricklayers	3.709	+0.4	+4.7
Structural Ironworkers	3.411	+0.4	+4.1
Carpenters	3.179	+0.1	+4.3

MATERIAL PRICES, 20-cities' average

Structural Steel (average 3 mills), per cwt	$5.00	0	+8.7
Lumber, 2x4 Fir, per M fbm	117.152	−0.1	−2.2
Lumber, 2x4 Pine, per M fbm	103.113	−0.2	+2.1
Cement, bulk, per bbl	3.760	+0.3	+5.8
Sand, per ton	2.418	+0.3	+2.8
Ready-mixed concrete, per cu yd	13.380	0††	+5.7

†Last month (Oct. 4) erroneously given as September, instead of October.
††September revised.

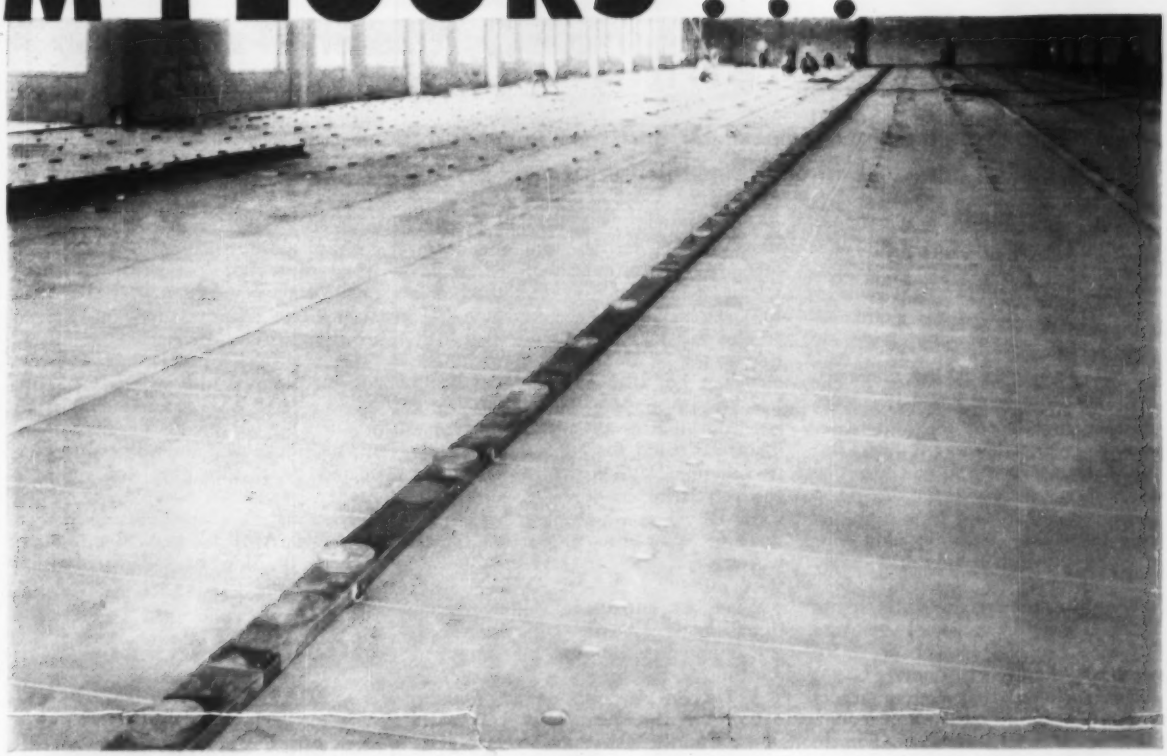
ENR INDEX REVIEW

	Construction Cost 1913 = 100	Construction Cost 1949 = 100	Building Cost 1913 = 100	Building Cost 1949 = 100	Volume 1913 = 100	Volume 1949 = 100
1955						
Oct	673.89	141.27	479.99	136.44	628	182
Nov	673.20	141.13	479.30	136.25	561	162
Dec	673.13	141.14	478.70	136.08	544	157
1955 Av	**659.72**	**138.31**	**468.80**	**133.33**	**600**	**173**
1956						
Jan	676.36	141.79	480.48	136.58	645	186
Feb	680.21	142.59	483.08	137.32	736	213
Mar	680.20	142.59	488.14	137.34	786	227
Apr	683.28	143.24	485.56	138.02	764	221
May	688.43	144.32	487.36	138.54	684	198
June	692.13	145.09	488.70	138.92	636	184
July	694.75	145.64	489.28	139.07	740	214
Aug	696.31	145.97	491.22	139.63	583	168
Sept	704.91	147.77	500.10	142.16	580	168
Oct	703.88	147.56	499.54	142.00	729	211
Nov	704.13	147.61	500.48	142.27	...	...

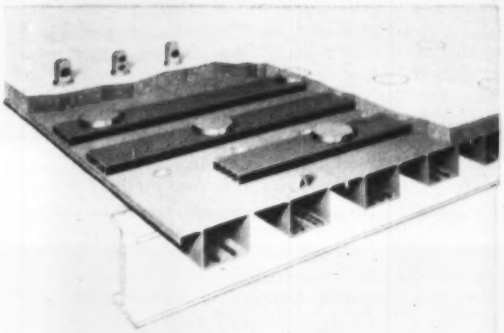
MATERIAL SHORTAGES

- Though demand for many building materials has eased in recent weeks, the chief exceptions are steel items as follows:
- **Structural steel**—Short in Atlanta, Baltimore, Birmingham, Boston, Chicago, Cincinnati, Cleveland, Dallas, Denver, Detroit, Kansas City, Los Angeles, Minneapolis, New York, St. Louis, San Francisco, Seattle, Montreal, Toronto.
- **Reinforcing bars**—Short in Atlanta, Baltimore, Birmingham, Chicago, Cincinnati, Denver, Detroit, Los Angeles, Minneapolis, New Orleans, St. Louis, Seattle, Montreal, Toronto.

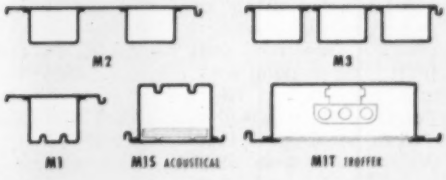
M-FLOORS . . .



Cost Less . . . Provide Electrical Availability Everywhere!



Cross Section of an Electrified M-Floor constructed with Mahon M-Floor Section M2. M-Floor Cel-Beam Sections are available with either Two or Three 6" wide Cel-Beams in a 24" width. Also available are Cel-Beam and Open-Beam Sections for long span roof construction; Perforated Acoustical Sections for combined roof-ceiling construction; and Acoustical and Troffer Sections for recessed lighting in concrete joist and slab construction of floors and roofs.



In addition to the structural function of M-Floor Sections, Cel-Beams in electrified installations provide the unlimited built-in raceway capacity which insures a building against electrical obsolescence in years to come. When you have decided on Cellular Steel Floor construction, call in a Mahon engineer and have him show you the many advantages which have been engineered into the design of M-Floor Cel-Beam Sections. You get higher Section Modulus with less weight in M-Floors . . . the Strength/Weight ratio of M-Floor construction will save up to 30% in the structural frame and foundation of some multiple story buildings. Cel-Beams in M-Floors are wide enough to permit 4" diameter access handholes between Electrical Header Ducts and Cel-Beam Raceways, yet they are narrow enough to provide adequate and evenly distributed beam-web support for the top plate. These are important design features . . . features which have direct and far-reaching effects not only on the initial building cost, but in the cost of subsequent changes in electrical and communication circuits throughout the life of the building. You'll want to compare these important design features before you select a Cellular Steel Sub-Floor for your next building. See Sweet's Files for complete information, or write for Catalog M-57.

THE R. C. MAHON COMPANY • Detroit 34, Michigan

Sales-Engineering Offices in Detroit, New York and Chicago • Representatives in Principal Cities

Manufacturers of M-Floors (Electrified Cel-Beam Floor Systems), Insulated Metal Walls and Wall Panels, Permanent Concrete Floor Forms, Steel Roof Deck and Long Span M-Decks, Rolling Steel Doors, Grilles and Underwriters' Labeled Automatic Rolling Steel Fire Doors and Fire Shutters.

MAHON

How to Cut Drafting Costs

Company uses clerks as "legmen" for draftsmen; applies 11 techniques to save time through simplified drafting

Several thought-provoking suggestions for reducing drafting costs were advanced by Jay H. Bergen, Standards Administrator, American Machine & Foundry Co., Greenwich, Conn., at the Seventh National Conference on Standards, which was held in New York City, Oct. 22 to 24. Sponsored by the American Standards Association, the conference highlighted the importance of standards to American industry.

The recommendations on drafting resulted from studies made by AMF that indicated the length of time required to produce drawings and how draftsmen spend their time.

• **Where the time goes**—AMF found that the average drawing took about 13 hours or about 4.5 hr per sq ft for mechanical engineering drawings.

Records showed that a group-leader spends 43% of his time acquiring information, 7% giving information to others and 30% on such items as small talk, smoking, washing hands, sharpening pencils, reading miscellaneous memos and other items of similar importance.

A checker spends 13% of his time acquiring information, 62% on checking and 25% on miscellaneous items not connected with his work.

A draftsman may spend 23% of his time acquiring information, 53% working on layouts or details and 24% on miscellaneous nonproductive items. Averaging out the percentages, a typical drafting employee spends 73% of his time on productive work and 27% on nonproductive.

• **Efficiency is stepped up**—Bergen said that AMF increased the efficiency of designers and detailers by adding clerical help who collect information and act essentially as legmen for the draftsmen. The clerks secure catalogs, prints, sharpen pencils, get miscellaneous supplies that might be needed and make themselves generally useful.

"Because of the wide wage differential between board people and clerks," said Bergen, "we found that even though the clerks might be used inefficiently, the over-all efficiency of the drafting section improved considerably."

The studies also showed that design engineering costs could be broken down into: (1) 15% for job preparation; (2) 45% for designing and detailing; (3) 28% for checking; (4) 4% for release of completed work; and (5) 8% to cover miscellaneous expenses.

This led AMF to conclude that little else could be done to improve basic efficiency but that anything that could be done to remove unnecessary work from drawings would cut drafting time. The men could then spend more time on functional design than on frills, and the percentage of drawings voided because they become obsolete before the machine went into production, could be reduced.

• **Ways to cut costs**—Following up this thought, Bergen said, led AMF to adopt 11 techniques for simplified drafting:

1. Use of description to eliminate delineation. For example, a rectangular object can be described by giving its height, width and depth; a drawing is not required.

2. Use of description to eliminate projected views. For example, the term diameter on a side view eliminates the need for an end view.

3. Omission of elaborate pictorial or repetitive detail. For example, dotted lines for hidden surfaces are not necessary in several views of the same object.

4. Incorporation of key legends to indicate hardware. The outline is shown only where it is necessary to indicate the position of a particular piece.

5. Use of dotted lines only to aid clarification. For example, in two views of a drilled hole, the size and depth of the hole can be given by a note.

6. Elimination of cross hatching.

7. Use of symbols to indicate various hole sizes. For example, the letter A is placed where the centerlines cross for, say, a ½-in. hole and B at the location of ⅝-in. hole, and notes identify A and B, thus eliminating the drawing of holes.

8. Elimination of hand lettering. The longer a man works on the drafting board, the sloppier his lettering becomes, Bergen claims. Typing reduces the chance of misspelling and provides information in a standard form. AMF uses effectively an applique—a transparent paper with glue on the back and a covering sheet over the glue—on which information is typed and which is applied to tracings.

9. Omission of arrowheads. Where needed to show the end of a dimension line, a dot can be used.

10. Use of datum lines for dimensions. A draftsman places a zero at a starting point and then inserts the actual dimension between that point and an extension line directly above the latter. The resulting drawing, Bergen says, appears cleaner and less confusing.

11. Use freehand sketching wherever possible (applied to drawings 17x22 in. and smaller). AMF uses tracing paper or a drawing board with a grid as an aid in sketching. Also, isometrics are considered as a substitute for multiple views.

By using these techniques, Bergen concluded, AMF has been able to show a saving of 35% to 55% in drafting time.

Structural Steel

Stronger, cheaper, better material coming by 1990, AISC official tells group

Taking a 35-year peek at the path of progress, a prominent steel executive last week predicted that by 1990 structural steels will be stronger, more versatile and more economical to buy.

L. Abbett Post, executive vice president of the American Institute of Steel Construction, told the group's 34th annual convention to expect:

• High-strength, low-alloy steels for general construction.

• An instant fusion method to join structural steel pieces, replacing current bolting, riveting and welding methods.

• Increased strength which will enable fabricators to cut material in smaller sections, than are used now, making structural steel more versatile and also yielding some cost advantages.

Post also predicted high-alloy steels "somewhat like those created for today's aircraft and auto engines, for increased strength and mass required for highways and bridges that will have to accommodate motor traffic moving at higher speeds than now and carrying heavier loads."

Structural steel fabricators also may be working with other materials, Post predicted. He said it is likely that fabricators will extend their operations by 1990 to supply structural products made from titanium, other nonferrous metals and plastics.

Contracts Climb in October

Heavy construction contract awards in October raced along at the second highest weekly rate of the year, surpassed only by March.

Highway contracts, as reported by ENGINEERING NEWS-RECORD and CONSTRUCTION DAILY, broke all records in October on a weekly basis as states and municipalities pushed ahead with their mammoth roadbuilding programs.

The total for all types of heavy construction last month was $1.9 billion, up 27% over September and 23% ahead of October 1955. The heavy October volume helped to push the 10-month total to $18.4 billion, a new record. The total was 17% above the comparable January-through-October period in 1955.

With only two exceptions, commercial building and private bridges, all types of heavy construction had larger contract totals in October than in September. And, only mass housing and private bridge projects failed to surpass the October 1955 figures.

Private mass housing contracts of $446 million topped all classes of work in October. Michigan's Winchester Village accounted for $90 million, and in California a $7-million contract touched off what will be eventually a $150-million development. Another big housing contract was a $12-million Forest Knolls project to be constructed in Maryland.

The 10-month housing total of $4.7 billion is still the biggest single category in the construction field, despite the 11% drop in dollar volume from last year.

Second biggest category in dollar volume, and the one that has spent most of the year in the spotlight is industrial building with a 10-month total of $4.5 billion.

Industrial building ranked second to mass housing in October in value of contracts. The total for the month was $377 million, 5% ahead of September and 31% ahead of October 1955.

Among the major industrial building projects that helped to boost the October total were a $90-million power plant for West Virginia; a $20-million cement plant for Florida; a $22-million steam power plant unit for New York; and a $21-million steam power plant for California.

Public bridges and waterworks contracts piled up at the second fastest rate of the year, well ahead of September and also well ahead of the year-ago figure.

Construction Costs Remain Steady

Construction costs, as measured by the ENGINEERING NEWS-RECORD Building and Construction Costs Indexes, have been steady at the national level for two months.

The ENR Building Cost Index has stayed at the 500 mark for 10 consecutive weeks, one point below the record high of August 9. The ENR Construction Cost Index remains at 704 for the eighth straight week, two points under the all-time high reached in mid-August. Both indexes are based on 1913 = 100.

The November Construction Cost Index reading of 704.13 is a slight 0.05% below the October value, but it is 4.6% higher than a year ago. The Building Cost Index, which edged up 0.1% last month, is now at 500.48. That reading is 4.4% above the November 1955 value.

Scattered wage rate increases during the month of October and a 30-cents-per barrel portland cement price increase in New Orleans were offset by lumber price declines that were recorded in several cities.

During October, Douglas fir 2x4 prices declined in six cities: San Francisco, $1 per Mfftbm; Los Angeles, two dips for a total $2 decline; St. Louis, down $2 per Mfftbm; Cleveland, also down $2; New Orleans, down $5 and Birmingham, down $6.50 per Mfftbm. Southern pine dipped $2 per Mfftbm in Cleveland and St. Louis.

Boston and Denver bucked the downturn in lumber prices. In Boston, two increases hiked prices a total of $3 per Mfftbm during the month and in Denver, fir 2x4 prices sailed skyward by $15 per Mfftbm.

(B&F continued on page 138)

Engeering Construction Contracts October 1956

ENGINEERING NEWS-RECORD reports contractal U. S. Construction projects of the following minimum costs—Waterworks, excavation, drainage and irrigation, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000

Four Weeks—Thousands of Dollars (000 Omitted)

	October, 1956							U. S. Cumulative Ten Months		% Change	Canada October
	New England	Middle Atlantic	South	Mid-West	West of Mississippi	Far West	Total U. S.	1956	1955	'55 to '56	1956
Public Works											
Waterworks	1,273	13,552	994	11,237	11,933	2,961	41,950	304,124	231,318	+31	473
Sewerage	1,941	13,141	6,924	13,886	8,479	5,637	50,008	506,378	332,732	+52	1,170
Bridges	6,429	10,956	8,454	14,509	9,504	12,047	61,899	508,455	405,347	+26	3,530
Earthwork and waterways	6,819	5,153	24,639	2,250	5,230	17,786	61,877	640,233	461,969	+39	13,627
Streets and roads	11,098	60,296	47,573	34,086	43,845	26,987	223,885	2,053,820	1,821,223	+13	9,074
Public buildings, residential		25,197	516	1,398	10,673	3,397	41,181	285,722	224,885	+27	2,021
Other public buildings	7,947	45,298	29,816	27,377	30,429	38,659	179,526	1,721,003	1,462,534	+18	11,123
Unclassified	4,818	28,933	10,260	16,330	6,643	11,442	78,426	890,601	933,686	− 5	13,340
Total Public	38,325	202,526	129,176	121,073	126,736	118,916	736,752	6,910,336	5,873,694	+18	54,358
Federal government (included in above classifications)	9,393	10,244	36,875	20,994	18,512	33,235	129,253	1,449,999	1,419,742	+ 2	9,925
Private											
Bridges								4,404	2,069	+113	
Industrial buildings	11,491	62,810	124,976	66,262	59,794	52,019	377,352	4,525,141	2,342,929	+93	52,560
Mass housing	13,357	182,094	13,584	138,750	73,671	24,464	445,920	4,699,129	5,305,283	−11	5,056
Commercial buildings	15,524	32,428	5,155	57,587	49,729	30,993	191,416	1,603,781	1,393,140	+15	10,676
Unclassified		309	12,631	1,315	10,165	102,481	126,901	643,215	742,559	−13	1,500
Total private	40,372	277,641	156,346	263,914	193,359	209,957	1,141,589	11,475,690	9,785,980	+17	69,792
Total Engineering Construction:											
October, 1956—4 weeks	78,697	480,167	285,522	384,987	320,095	328,873	1,878,341				124,150
September, 1956—4 weeks	62,083	329,745	240,360	301,123	343,167	204,014	1,480,492				107,943
October, 1955—4 weeks	62,825	426,851	114,887	312,808	385,267	222,865	1,525,503				174,891
Ten Months 1956	968,203	4,670,935	2,199,622	3,932,187	3,896,233	2,718,846		18,386,026		+17	1,889,801
Ten Months—1955	739,640	4,381,597	1,655,535	3,421,933	3,681,970	1,778,999			15,659,674		1,441,476
% Change '55 to '56	+31	+7	+33	+15	+6	+53					+31

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Housing in 1957: Prices Up, Starts Down

Homebuilders expect higher prices and fewer starts in 1957, the National Association of Home Builders reported last week.

Median price on the 1957 house is expected to be about $15,200 as compared to $14,700 this year, a survey of 600 members of NAHB's Builders' Economic Council disclosed. This would represent a price increase of 3.4%.

Chief reasons cited by builders for the anticipated boost in home prices: higher land and construction costs; demand for larger houses; difficulty in financing lower-priced houses.

The survey turned up an interesting point in the builders' forecast: While they expected a 10% median downturn on a national basis, they predicted housing starts would decrease only 5% in their own localities.

A 10% decline in housing starts would push the 1957 total down to just about a million.

Some builders were cautiously optimistic about 1957. Their optimism is shared by Albert M. Cole, Housing and Home Finance Administrator. Cole predicts that housing starts will stay at a level of 1.1 million a year from now to 1960.

The housing chief also expects the current boom in industrial building to diminish, freeing more funds for the residential mortgage market.

Cole also forecast formation of new family groups in the years ahead would cause a housing boom "the like of which has never been seen."

Other results of the NAHB survey:

- Almost half the builders will make basic model changes in the 1957 homes.
- Two-fifths of the builders will be starting homes without firm commitments for mortgages.
- Only one builder out of four sells from inventory or during construction only. One out of 10 sells from models only. Most builders use combinations.
- About 40% of the builders reported no unsold homes.
- One builder out of three handles trade-ins. But the trade-ins do not account for any sizable portion of the homebuilders' volume. HHFA commitments are not a significant factor for the trade-ins.
- The home improvement market is being tapped by about one homebuilder out of four. Improvement and rehabilitation work accounted for about 8% of the dollar volume of those doing such work.

What's in a Name?—A Contract!

When two large Greater Boston contractors submitted identical bids of $671,000 on a contract to build two dormitories and a dining hall addition at Dow Air Force Base, Bangor, Me., Army Engineers picked the name of the winning bidder out of a waste-basket. Loser Sam Volpe, at left, of S. Volpe & Co., Inc., helps the winner, Joseph P. Day, of Wexler Construction Co., hold the basket, as Lt. Col. B. G. Belote, Assistant Division Engineer, Army Engineers, draws the winning slip.

Connecticut Postpones Sale Of $75-Million Road Bonds

High interest rates were blamed last week for a decision to postpone the sale of $75 million in Connecticut Turnpike bonds. The bond sale originally was scheduled for Oct. 30.

State Treasurer John Ottaviano said that if the bond market improves in the next few weeks, the state will try to market the issue about Nov. 20.

The bonds will be retired over a 40-year period from tolls and other revenues from the new 129-mi Connecticut Turnpike, scheduled for completion by 1958.

Business Briefs . . .

• **Tax exempt**—Concrete batching plants are now exempt from state sales tax in Ohio, the state's Supreme Court has ruled. The tax does not apply to industrial processing plants.

• **Marquette's profits**—Marquette Cement Manufacturing Co. boosted sales and net income during the third quarter. Sales amounted to $13.8 million, compared with $12.1 million for the same period last year; net income for the quarter was equal to $1.02 per share as against 86 cents a share in 1955.

• **Westinghouse contract**—Kaiser Engineers, holding a contract to design, construct and equip a $130-million expansion for Tata Iron & Steel Co. mills at Jamshedpur, India, passed along a $4-million contract to Westinghouse Electric Corp. Westinghouse will completely electrify a medium and light structural steel mill and provide auxiliary direct current for two other mills.

• **School funds sought**—Tennessee's county judges voted unanimously to seek a state appropriation of at least $10 million for emergency school construction during the next two years. They also endorsed proposed legislation that would permit the state to issue $15 million in bonds annually for three years to "catch up" with state highway needs.

• **Local aid**—When national bond houses turned a deaf ear to financing attempts of the lawsuit-harassed Metropolitan Airports Commission of Minneapolis and St. Paul, seven Twin Cities banks came to the rescue. The banks bought the securities, at a 3% interest rate, permitting a start on the commission's airport expansion program.

• **Kaiser buys Fir-Tex**—Kaiser Gypsum Co., subsidiary of Permanente Cement Co., bought the physical assets of Fir-Tex Insulating Board, Inc.

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Union Autonomy Rises Again

Efforts to unite AFL and CIO forces in Florida stumble over the right of union affiliates to control their own affairs

Merger of Florida AFL and CIO forces on the state level collapsed last week when the Florida Federation of Labor (AFL) rejected as unacceptable two of the CIO candidates for membership on the Executive Council of the proposed merged organization. AFL-CIO President George Meany was asked to intervene.

Unlike the jurisdictional conflict between the AFL building trades and CIO industrial unions, which is essentially an economic problem and which earlier stalled several state mergers, the Florida problem was reported as a political one—control of organized labor in the state. But like the jurisdictional issue, it involves the question of union autonomy that has represented one of the biggest challenges to the AFL-CIO as well as to the orderly settlement of jurisdictional conflicts both within the building trades and between the building trades and industrial unions.

Efforts to merge the Florida forces commenced last February and the proposed merger agreement was drawn up in August. State and AFL and CIO conventions convened last week to act on the proposal. Under the agreement, the AFL, claiming 119,000 members, was to elect nine officers. The CIO, with 12,500 members, was to elect four.

When the CIO was informed that the AFL would not accept two of the officers it proposed, one delegate crystallized the general feeling by declaring that neither the AFL nor any other group has the right to tell another group how to conduct its affairs.

The AFL-CIO constitution on the national level preserves and protects the autonomy of all affiliates. That provision has been a key in the lathers' opposition to compulsory participation in jurisdictional settlements by the National Joint Board and has placed the burden on use of voluntary agreements for settling interunion conflicts, including the one existing in Florida. The voluntary method has been specified for extending the AFL-CIO No-Raiding agreement, the AFL Internal Disputes Plan and the CIO Organizational Disputes Agreement. And it was announced last week by the iron workers at their national convention as their established policy for settling jurisdictional disputes.

Delegates to the Florida AFL convention refused to air in public their objections to the CIO officers. But one official indicated the objections stemmed in part from the existence of some "catch-all organizations" in the CIO as well as "some people who do not take the labor movement seriously."

At mid-week, neither the AFL nor CIO groups showed any indication of backing down from the positions they had taken.

Under the AFL-CIO constitution, state organizations are given until Dec. 5, 1957, to complete their mergers. The tally of those already completed stood at 16 when the Nebraska State AFL-CIO was formed two weeks ago.

Official of Nonunion Group Finds His Project Picketed

Formation of an open-shop contractors' association in Arizona has boomeranged. Picketing by AFL-CIO building trades was reported last week to be blocking completion of a residential development under construction by the president of the association.

The Independent Contractors Association of Arizona was formed by 52 nonunion contractors several weeks ago (ENR Oct. 4, p. 147). Its purpose is to afford small contractors, who may lack the financial resources necessary to engage in litigation, a chance to contest in court alleged violations of state and federal labor laws, with particular emphasis on the state's right-to-work law and the Taft-Hartley Act.

E. Douglas Dana of Phoenix, association president, is building 40 homes in the $35,000-to-$50,000 bracket on the picketed subdivision. Truck drivers delivering street paving materials have refused to cross the picket lines.

Building Trades Condemn Licensing of Organizers

The Kentucky State Federation of Labor has asked for the repeal, by legislative or judicial action, of a Russellville, Ky., ordinance requiring union organizers to pay an occupational license fee and to obtain a license from the city. The ordinance had been condemned earlier as "unfair" by the State Building and Construction Trades Council.

Similar in nature to a number of measures passed elsewhere this year (ENR Oct. 4, p. 147), the ordinance requires organizers who are members of a union to pay a fee of $250. The fee for nonunion solicitors is $100. Fines, coupled with a 30-day jail sentence, range from $50 to $100 for violations.

Russellville's Mayor, J. Fuqua, has defended the ordinance as non-discriminatory. He claims it merely brings labor organizers into line with other groups such as lawyers, doctors, merchants and peddlers.

When Is It Legal?

NLRB's roving picket rule rejected by federal court

The perplexing question of whether or to what extent the Taft-Hartley Act bans use of roving pickets has come before the U. S. District Court in New Orleans. Although the court enjoined picketing by Local 406 of the operating engineers at construction sites where the primary employer was making deliveries, it rejected the National Labor Relations Board's contention that picketing at the premises of secondary employers is illegal per se if the picketing could be confined effectively to the place of business of the primary employer.

The picketing related to union attempts to organize crane and dragline operators of a ready-mixed concrete firm. Delivery trucks of the firm were followed by pickets to construction sites. Seven of the eight general contractors using the firm's concrete ceased doing so after the picketing began.

The union was charged with a secondary boycott and the NLRB sought the injunction pending its disposition of the charges.

In granting the injunction, the court saw no legal objection to use of roving pickets at premises of secondary employers if the object is merely "to persuade people of the righteousness of the cause." Such picketing becomes illegal, the court declared, if the object is to create work stoppages and to force secondary or neutral employers to cease doing business with the employer with whom the union has a dispute.

The court concluded there was reasonable cause to believe that the operating engineers were using the pickets for this illegal object, although the picketing may not have been unlawful in itself.

(*Labor continued on page 142*)

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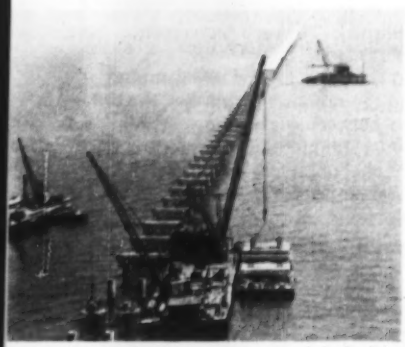

Installing the piles, pile caps and deck slabs.

The 37 acre manufacturing yard, built specifically for this job.

By using simplified design and unique assembly line construction methods, the $30,700,000 new Lake Pontchartrain Causeway, stretching 24 miles from the outskirts of New Orleans to Mandeville, La., was completed four months ahead of schedule. The use of Raymond Prestressed Concrete Cylinder Piles was a major factor in the saving of time and money in this project. Under the direction of Raymond engineers, a pile fabrication yard was constructed at the bridge site. Just three months after the manufacturing yard was started, the first Raymond Cylinder Pile came off the assembly line and was floated to the installation point. In all, the contractor, who was licensed to manufacture and install the Raymond Piles, used 4,886 fifty-four inch piles averaging 88 feet in length, 2,240 pile caps and 2,232 185-ton Prestressed Deck Slabs in the bridge.

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Jobless Benefits

Integration of state and private plans questioned

Another effort may be made to test the legality of simultaneous payment of state unemployment insurance benefits to unemployed workers receiving payments under private supplemental unemployment benefit (SUB) plans.

It was disclosed at a manufacturers' convention in California that a group of state employers plans to challenge in court before the end of the year the State Attorney General's ruling that state benefits can be integrated with SUB payments.

Private plans that may be affected by the suit exist largely in the auto, steel and container industries, but a ruling adverse to integration also might affect the proposed compulsory savings plan won in principle last summer by northern California plumbers. Under that proposal, still to be worked out in detail, funds in savings accounts built up by employer contributions could be used in times of unemployment to supplement state benefits.

It will be argued in the proposed California court test that SUB payments are in fact wages, making laid-off workers who receive them ineligible for state benefits.

Concern over integration of the two systems stems from several things, including a fear that management groups with SUB plans may form a coalition with labor to exert pressure for higher state benefits, and a fear that combined payments may be high enough to induce laid-off workers to avoid temporary or interim employment.

Most of the SUB plans call for weekly payments equal to 60 or 65% of take-home pay up to 26 weeks, with industry paying the difference between state benefits and the total. So far, 26 states have approved integration of their state system with auto-type SUB plans.

Pre-Job Training

Bricklayer apprentices are taught trade fundamentals

Pre-job training still is proving successful as part of the bricklayers' apprenticeship program. So far this year 57 boys, who aspire to become bricklayers, have received pre-job training under four programs conducted in the North Central States.

Purpose of the pre-job training, according to the union, is to introduce young bricklayers to the fundamentals of the trade and to give them practical experience in the use of tools and equipment before they start their formal on-the-job training. With this training behind them, the boys can go out on a job as apprentices and be immediately productive. Duration of the training is eight weeks. Content of the courses varies from area to area.

Under the program conducted at Omaha, for example, students worked eight hours a day, five days a week, and spent the first three weeks constructing walls in the classroom and the last three weeks doing actual repair work for the Board of Education. Space was provided by local school authorities and materials and equipment were donated by manufacturers, dealers and Associated General Contractors. The boys were paid $4.00 a day from a fund established by the AGC.

Those enrolled in the course conducted at Iowa State College in Ames had a different program—two hours of classroom instruction each morning in job mathematics, trade drawings and estimating, and the rest of the time on the practical application of the trade. They worked with brick, tile and concrete blocks; built walls, piers, chimneys and fireplaces; and practiced window and door jamb construction. Conducted in cooperation with the college's Engineering Extension Service, the program was sponsored by the union's Iowa State Conference, Structural Clay Products Institute Region 6, Master Builders of Iowa, and the Iowa Concrete Masonry Association.

Other pre-job training courses were conducted at the North Dakota State School of Science, Washpeton, and St. Cloud, Minn.

Dunlop Explains Role of Joint Board

John Dunlop, impartial chairman of the National Joint Board for the Settlement of Jurisdictional Disputes, defended the Joint Board as a practical instrument for settling disputes within the construction industry when he addressed delegates to the laborers' convention in Chicago late last month. But he suggested the final solution lay in constructive steps by the building trades to cut down the number of disputes that arise.

The board has been in operation since 1948. Until last year, union participation was voluntary. A change in the constitution of the Building Trades Department now requires all affiliates to comply with the board's procedure. Under that procedure, all interunion jurisdictional disputes over work assignments not otherwise settled are supposed to be resolved by the board on a spot decision basis while the unions refrain from work stoppages. Until recently, the National Labor Relations Board has been willing to recognize the Joint Board as the final arbiter, but the frequency of non-compliance with board procedure now indicates the possibility of a new approach by the NLRB (ENR Oct. 11, p. 142).

When the acoustical ceiling dispute between carpenters and lathers arose last year in the Lee case, the board announced a "hands off" policy, leaving the procedure of the Joint Board unchallenged. Lately, however, a number of jurisdictional disputes have gone into the NLRB hopper, but the board has not yet reached the point of deciding the cases on their merits.

Dunlop's defense of the Joint Board lay in the board's unique composition. The board is a device for settling family disputes within the family by people, Dunlop said, who have spent their lives in and who know the industry, rather than by courts and government agencies unfamiliar with the nature and problems of the industry. It logically represents both labor and management, both of whom have an interest in the disposition of disputes.

While the board attempts to keep construction jobs moving as day-to-day disputes arise, Dunlop observed, international union agreements try to iron out jurisdictional conflicts before they erupt in disputes. Since the board was established, 20 such agreements have been reached.

At the same time, Dunlop noted, it's up to the unions to work out the differences between local union customs and national union rules. For jurisdictional peace, he observed, embraces the concept of uniformity.

Labor Briefs . . .

• **Jurisdiction**—Due largely to the impetus of the federal highway program, the teamsters union foresees greater use of the LeTourneau-Westinghouse I "C" Tournarocker and the Rex Railporter and has urged its members to see that jurisdiction over their operation is given to teamsters.

• **Representation**—In a case involving a labor contract with the Colorado Building Supply Co., the National Labor Relations Board ruled that an automatic renewal clause does not necessarily bar a representation election. It regarded renegotiation of a large part of the contract as termination.

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Take the triple-tested steels that go into Bucyrus-Eries, for example. Hammer forging, annealing, heat treating, case hardening, flame hardening, and stress-relieving processes are applied — each where it contributes most to strength, toughness, and hardness. The most modern arc welding methods are used to produce highest quality fabricated parts.

Skilled manufacturing is only one of many Bucyrus-Erie quality features that add up to more actual working time each shift — and to greater output and profit. You get top quality design, too: easy adjustments and accessibility speed maintenance . . . balanced, smooth digging cycles mean no overstressing of any parts . . . and conveniently grouped, easily manipulated controls add to digging time by cutting waste motion and reducing operator fatigue. For complete information on Bucyrus-Erie shovels and draglines from ⅜- to 4-yd. capacity, see your Bucyrus-Erie distributor today. For information on larger sizes, write us direct.

214E56C

Bonus Quality
saves you money

Skilled chemists and physicists in the company's own metallurgical laboratory regularly study new materials, alloys, and treating processes to determine their suitability for application to Bucyrus-Erie machines. Here a laboratory technician burns chips from a foundry test bar to determine carbon content of the steel. Each heat is triple-tested to ensure meeting specifications.

See You at the **ROAD SHOW** • **CHICAGO, Jan. 28- Feb. 2, 1957**

BUCYRUS-ERIE COMPANY
SOUTH MILWAUKEE, WISCONSIN

Your Wickwire Rope Distributor and our sales engineer ... a helpful team

This sales engineer—an expert on the selection, installation and maintenance of our products—is with your Wickwire Rope Distributor every time he makes a call.

True, sometimes he's hundreds of miles away, working in the field or at the mill. Yet, even if he's not there in person, your Wickwire Distributor has the full assurance that sales engineers such as this one are *always* quickly available to help you.

It's just one more reason why your Wickwire Distributor knows he's got top-quality wire rope, slings and strand to sell . . . and that these products will serve you well.

4086

A PRODUCT OF THE COLORADO FUEL AND IRON CORPORATION

OFFICIAL PROPOSALS

Bids: November 15, 1956

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, Public Buildings Law, and Article 2, Title 9 of the Public Authorities Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., eastern standard time, on the 15th day of November 1956, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1, G. L. Nickerson, District Engineer, 333 Broadway, Albany 1, N. Y.						
Rensselaer (Routes 9 & 20)	FARC 56-100	Boston-Albany, S.H. 202 Schodack Center-Nassau, S.H. 536 Schodack Center-Valatie, Pt. 2, S.H. 5029 Project U-F-368(9)	4.03	Asp. Conc. Opt.=3.60 Mi.; 9" Cem. Conc. Pavt. 46'-54'; Var. Wide=0.36 Mi.; Misc. Work=0.07 Mi.; Widen 2 existing bridges	$75,000 Plans $25	$1,351,000
Schenectady	M-56-8	Movable Dam No. 4, Lock 8E, Erie Canal near Scotia	....	Painting Superstructure & Repairing Sill	$4,500 Plans $10	78,500
DISTRICT No. 4, B. F. Perry, District Engineer, Barge Canal Terminal, Rochester 1, N. Y.						
Monroe	FISH 56-9	Interstate Route Connection No. 7 (Rochester-Bushnell Basin Pt. 2) Project I-1107(3)	2.30 (3.57 Acc.)	9" Cem. Conc. Pavt. 26'-25' Var. Wide=4.99 Mi.; Asp. Conc. Ty. 2A=0.58 Mi.; Misc. Work=0.30 Mi.; 3 Hy. Sups. Comp. I-Beams 181.7', 163' & 164'; 2 Ped. Overpasses I-Beams 148' and 145.5'; 2 Brs. R.C. Arch 28' & 33.8'	$147,000 Plans $50	2,674,000
DISTRICT No. 5, E. G. H. Youngmann, District Engineer, State Office Bldg., 65 Court St., Buffalo 2, N. Y.						
Chautauqua	FASS 56-11	Frewsburg-Kennedy Road C.R. 7, 26 and part of 60 Project S-460(1)	2.46	Asp. Conc. Opt.=2.42 Mi. Misc. Work=0.04 Mi.	$17,000 Plans $15	315,000
Erie	NT 56-7 NTC 56-8 STC 56-10	New York State Thruway—Niagara Sect.—Sub. N1 & N2 (Rossler-Clinton Sts.)	1.41 (2.27 Acc.)	9" Cem. Conc. Pavt. 26'-37' Var. Wide=2.02 Mi.; Asp. Conc. Ty. 2B=1.26 Mi.; Misc. Work=0.40 Mi.; 3 Hy. Sups. Comp. I-Beams 216.3', 191.8' & 217.8'	$210,000 Plans $50	3,742,000
Erie	FINTC 56-4 FINT 56-5 NT 56-6 FIRC 56-92	New York State Thruway—Niagara Sect.—Sub. N-7 (Ontario St.—So. Grand Island Bridge); River Road, S.H. 23; Sheridan Drive, S.H. 9216 & Sheridan Drive ext., S.H. 9333 Project I-865(10)	4.57 (5.53 Acc.)	9"—2 Course Cem. Conc. Pavt. 26'-25' Wide=7.29 Mi.; 9" Cem. Conc. Pavt. Var. Wide=0.24 Mi.; Asp. Conc. Opt.=1.13 Mi.; Asp. Conc. Ty. 2B=0.14 Mi.; Bit. Mac. Ty. 1=0.90 Mi.; Misc. Work=0.40 Mi.; 6 Hy. Sups. Comp. I-Beams 57', 301.3', 173.9', 314.8', 169.5' and 180.1'; 1 RR Sup. Comp. I-Beam 261.9'; 1 RR Sup. I-Beam 195'	$440,000 Plans $100	8,030,000
DISTRICT No. 6, J. H. Thomas, District Engineer, State Office Bldg., 30 W. Main St., Hornell, N. Y.						
Chemung	FARCC 56-101	Elmira City: East Church St., F.A.C. 54-11 Project U-221(9)	0.04	Installation of Sewer & Misc. Work	$3,500 Plans $10	64,000
DISTRICT No. 8, K. G. Rauer, Acting District Engineer, Pleasant Valley Road, Poughkeepsie, N. Y.						
Columbia	FERC 56-95	Copake Iron Works—Bashbish Falls, S.H. 1790 Project ER-24(1)	0.40	Stream Channel Relocation & Slope Protection	$3,500 Plans $10	64,000
Westchester, N. Y. & Fairfield, Conn.	FINET 56-7	New York State Thruway—New England Section—Sub. NE-5 (Byram River Bridge & Approaches); 2 Cross Roads Project I-1068(14)	0.30 (0.09 Acc.)	9" Cem. Conc. Pavt. 74'-82' Var. Wide=0.30 Mi.; Asp. Conc. Opt.=0.09 Mi.; 16 Sp. Bridge Plate Gird. & Comp. I-Beam 1262.8' Long	$200,000 Plans $50	3,602,000
DISTRICT No. 10, M. E. Goul, District Engineer, 325 W. Main St., Babylon, Long Island, N. Y.						
Bronx	FICBE 56-3	Cross Bronx Expressway Cont. 1D (Plimpton-Anthony Aves.) Project I-1084(24)	0.94	Demolition	$2,200 Plans $10	40,000
Queens (Rte. 25D)	FAHHE 56-2	Horace Harding Expressway Sect. 1 (Cont. 3) Project I-862(9)	0.86 (3.03 Acc.)	9" Cem. Conc. Pavt. with Carb. Black 26'-36' Var. Wide=0.77 Mi.; 9" Cem. Conc. Pavt. Var. Wide=0.42 Mi.; Asp. Conc. Opt.=2.70 Mi.; 3 Brs. Comp. I-Beams 439.9', 382', and 335.1'; 1 Ped. Overpass Steel Girder 131.5'	$400,000 Plans $100	6,981,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage) Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Instructions to Bidders".

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

Bids: November 15, 1956

New York State Road Work

NOTICE TO CONTRACTORS

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Public Building Law and Highway Law, sealed proposals will be received, until 10:30 A.M., on November 15, 1956 by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, the Governor Alfred E. Smith State Office Building, Albany, N. Y. for:

Contract B.P. 56-51, Pt. IV for Beach Protection (Three Stone Groins) at Atlantic Beach, Town of Hempstead, Nassau County, New York

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts and Accounts, 14th Floor, The Gov. Alfred E. Smith State Office Bldg., Albany, New York.

(b) Department of Public Works, 270 Broadway, New York City, N. Y.

(c) In addition to the above mentioned offices, plans, maps and specifications for Contract B.P. 56-51, Pt. IV may be examined and obtained at the office of Mr. Milton E. Goul, District Engineer, 325 West Main St., Babylon, L.I., New York.

The deposit for Plans and Proposal Forms for Contract B.P. 56-51, Pt. IV is $10.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

The Engineer's Estimate of Cost for Contract B.P. 56-51, Pt. IV is $775,000.00

Proposals for B.P. 56-51, Pt. IV must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of five percentum, (5%) of the amount of the bid. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Public Building Law and to the Highway Law as set forth in "Instructions to Bidders" in the contract specifications. The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Invitation No. 08-4795) will be received at Denver, Colorado, until December 11, 1956, for furnishing two pumping units consisting of two vertical-shaft, 5,000 horsepower, Francis-type hydraulic turbines and two vertical-shaft, centrifugal-type pumps, each with capacity of 150 cfs under a total head of 145 feet for Helena Valley Pumping Plant, Missouri River Basin Project, Montana. Delivery is desired within 540 days. For particulars, address Bureau of Reclamation, Building 53, Denver Federal Center, Denver 2, Colorado, W. A. Dexheimer, Commissioner.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Invitation No. 08-4797) will be received at Denver, Colorado, until December 11, 1956, for furnishing one 120-inch diameter steel penstock, approximately 500 feet long; and one 75-inch steel discharge pipe approximately 335 feet long, for Helena Valley Pumping Plant, Missouri River Basin Project, Montana. Delivery is desired within 180 days. For particulars, address Bureau of Reclamation, Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

OFFICIAL PROPOSALS

Bids: November 20, 1956

West Side Sanitary District
Onondaga County, New York

ADVERTISEMENT
NOTICE TO CONTRACTORS
CONSTRUCTION OF THE
MAIN PUMPING STATION

Separate sealed bids for the construction of the Main Pumping Station, West Side Sanitary District, will be received for the Onondaga Public Works Commission by the County Purchasing Agent, Room 107, County Court House, Syracuse 2, New York until 2:00 P.M., Eastern Standard Time, November 20, 1956 and there at said office, publicly opened and read aloud. Bids will be received for:

Contract No. 2—General Construction
Contract No. 3—Electrical Work
Contract No. 4—Mechanical Equipment & Piping

These Contracts provide for the construction of the Main Pumping Station, West Side Sanitary District, including a forty-two inch emergency relief sewer, a forty-two inch connection to the West Side Trunk Sewer, and a connection to a 24-inch force main.

Information for Bidders and all Contract Documents may be examined at said office and copies of the same there obtained upon payment of Ten Dollars ($10.00) for each set. Any bidder submitting a sealed bid to the Purchasing Agent, Onondaga County, upon returning such set in good condition within thirty (30) days of the date of receiving bids, will be refunded the full amount of his deposit. One-half of the deposit will be refunded to all non-bidders upon return of the sets of plans and contract documents in good condition within thirty (30) days of the date of receiving bids.

Copies of the above described Contract Documents may be examined at no expense at the above office of the Purchasing Agent, at the office of the Onondaga Public Works Commission, 418 South State Street, Syracuse, New York, or at the office of O'Brien & Gere, Consulting Engineers, 400 East Genesee Street, Syracuse 2, New York.

The right is reserved to waive any informalities in the bids and to reject any or all bids.

ONONDAGA COUNTY, NEW YORK
By: Robert W. Sollinger,
County Purchasing Agent
Dated: October 25, 1956

Bids: November 20, 1956

West Side Sanitary District
Onondaga County, New York

ADVERTISEMENT
NOTICE TO CONTRACTORS
CONSTRUCTION OF THE
WEST SIDE FORCE MAIN
CONTRACT NO. 5

Separate sealed bids for the construction of the West Side Force Main, West Side Sanitary District Contract No. 5, will be received for the Onondaga Public Works Commission by the County Purchasing Agent, Room 107 County Court House, Syracuse 2, New York until 2:00 P.M. (Eastern Standard Time), November 20, 1956 and there at said office publicly opened and read aloud.

The West Side Force Main includes the construction of approximately 9,550 lineal feet of 24-inch reinforced concrete pressure pipe sewage force main, including two railroad crossings, a brook crossing, and rip-rap protected embankment, together with various appurtenances.

Information for Bidders and all Contract Documents may be examined at the said office and copies of the same obtained upon payment of Ten Dollars ($10.00) for each set. Any bidder who has submitted a bona-fide proposal, upon returning such set in good condition within thirty (30) days of the date of receiving bids, will be refunded the full amount of his deposit. One-half of the deposit will be refunded to all non-bidders upon return of such set within thirty (30) days of the date of receiving bids.

Copies of the Contract Documents may be examined at no expense at the above office, at the office of the Onondaga Public Works Commission, 418 South State Street, Syracuse 2, New York, and at the office of O'Brien & Gere, Consulting Engineers, 400 East Genesee Street, Syracuse 2, New York.

The right is reserved to waive any informalities in the bids and to reject any or all bids.

ONONDAGA COUNTY, NEW YORK
By: Robert W. Sollinger,
County Purchasing Agent
Dated: October 25, 1956

OFFICIAL PROPOSALS

Bids: November 15, 1956

New York State Road Work

NOTICE TO CONTRACTORS

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 A.M., Eastern Standard Time, on November 15, 1956, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for:

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON INTERSTATE ROUTE 505, SECTIONS A, B AND C, FROM OSWEGO COUNTY LINE TO PHILOMEL CREEK, TOWNSHIPS OF ELLISBURG, ADAMS, WATERTOWN, HOUNSFIELD AND PAMELIA, JEFFERSON COUNTY, WHICH CONSTITUTES CONTRACT NO. SPEC. SM-96.

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts and Accounts, 14th Floor The Governor Alfred E. Smith State Office Building, Albany 1, New York.

(b) Mr. Robert W. Sweet, District Engineer, 444 VanDuzee Street, Watertown, New York.

(c) Mr. William M. Trainer, Associate Contract Engineer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50 percent of deposit.

The Engineer's estimate of cost for this work is $32,925.00.

Proposal for this contract must be submitted in separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $1,650.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instruction to Bidders."

The right is reserved to reject any or all bids.

J. W. JOHNSON
SUPERINTENDENT OF
PUBLIC WORKS

Bids: November 27, 1956

Contract 439

MARGARETVILLE-ARKVILLE SEWERS

SEALED BIDS will be received by the Board of Water Supply, at its offices, thirteenth floor, 120 Wall Street, New York City, until 11:00 A.M. Eastern Standard Time on Tuesday, November 27, 1956 for Contract 439, for the construction of about six miles of sewers, including a railroad crossing, four stream crossings, manholes and other appurtenances, and a total of about six miles of house connections. The sewers will be from six to 15 inches in diameter and the house connections six inches in diameter. The location of the proposed work is in the Village of Margaretville and in the hamlet of Arkville, in the Town of Middletown, Delaware county, New York.

At the above place and time the bids will be publicly opened and read. Pamphlets containing information for bidders, forms of bid and contract, specifications, contract drawings, requirements as to surety, etc., can be obtained in Room 1312 (Acting Secretary's Office), at the above address, upon application in person or by mail, by depositing the sum of five dollars ($5.00) in cash or its equivalent for each pamphlet. Within 30 days following the award of contract or rejection of bids, the full amount of such deposit will be refunded for each pamphlet submitted as a bid and a refund of four dollars ($4.00) will be made for each other pamphlet returned in acceptable condition. Arrangements will be made whereby prospective bidders desiring blueprints of the contract drawings for their own use may secure same, the cost thereof to be paid by them. For further particulars, apply at the office of the Chief Engineer at the above address.

IRVING V. A. HUIE, President, EDWARD C. MAGUIRE, HERBERT M. ROSENBERG, Commissioners, Board of Water Supply; BETTY COHEN, Acting Secretary.

OFFICIAL PROPOSALS

Prequalification Date: November 7, 1956.

Board of Education—
Bureau of Construction

NOTICE RE: PREQUALIFICATION
FORMS FOR CONTRACTORS

NOTICE IS HEREBY GIVEN THAT

The Director, Bureau of Construction, 4th Floor, Room 407, 42-15 Crescent Street, Long Island City 1, New York, will receive applications for prequalification of bidders, from Contractors who may wish to submit bids for the proposed hereinafter specified contracts, as follows:

For General Construction, Plumbing & Drainage, Heating & Ventilating, Electrical Work & Lighting Fixtures for:

BOROUGH OF BROOKLYN
P.S. 11, Greene Ave., Between Waverly & Washington Aves.
J.H.S. 211, Aves. J & K, East 100th & 101st Streets.

BOROUGH OF BRONX
P.S. 146, Trinity & Cauldwell Aves., Teasdale Place and E. 165th Street.
J.H.S. 149, Willis Ave. between East 144th & 145th Streets.

BOROUGH OF MANHATTAN
J.H.S. 22, West side of Sheriff St., between Stanton and Houston.

BOROUGH OF QUEENS
J.H.S. 180, Beach Channel Drive, Rockaway Freeway, Beach 104th St. & Seaside Ave.
J.H.S. 194, 154th & 157th Sts., 17th Road and 17th Avenue.

BOROUGH OF RICHMOND
P.S. 3, Latourette St., Delia Avenue, Everett Place & So. Goff Avenue.

Prequalification application forms will have to be secured and must be submitted to the Director, Bureau of Construction Office, 4th Floor, Room 407, 42-15 Crescent Street, Long Island City, New York.

Bids when advertised will be received from prequalified bidders only.

Time for submitting prequalification applications by contractors not now on file will expire on Wednesday, November 7, 1956.

WILLIAM H. CORREALE
Director
Dated: October 25, 1956.

SEARCHLIGHT SECTION

This index is published as a service to the reader. Every care is taken to make it accurate, but SEARCHLIGHT SECTION assumes no responsibility for errors or omissions.

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OFFICIAL PROPOSALS

Bids: November 19, 1956

Pennsylvania Turnpike Commission Harrisburg, Pennsylvania

NOTICE TO BIDDERS

Sealed proposals will be received by the Pennsylvania Turnpike Commission through the Chairman, 11 North Fourth Street, Harrisburg, Pennsylvania, until 10:00 a. m. Eastern Standard Time, the 19th day of November 1956, and immediately thereafter will be taken to the Public Utility Commission's Hearing Room #1, North Office Building, State Capitol, Harrisburg, Pennsylvania, and publicly opened and read aloud for the following work:

Furnishing and Erection of Medial Guard Rail Barrier

Furnishing and Erection of Median Barrier and Guard Rail for Sign Bridges

Construction of Concrete Median Barrier on Structures

Copies of Plans, Specifications and Contract Documents are on file and open to public inspection on 1 November 1956 at the office of the Pennsylvania Turnpike Commission in Harrisburg, Pennsylvania. Plans, specifications and contract documents will not be available before this date for inspection or for mailing to prospective bidder.

Plans and contract documents may be obtained from the Commission upon deposit of ten ($10.00) dollars for each set. No refund will be made for contract documents returned, unless the project is withdrawn from letting by the Pennsylvania Turnpike Commission.

Copies of Specifications for grading, drainage, paving and structures may be purchased from the Pennsylvania Turnpike Commission for the sum of five dollars per copy.

Remittances are payable by check or P. O. money order to the Pennsylvania Turnpike Commission and must accompany requests for drawings, specifications and contract documents.

The character and amount of bid security to be furnished by bidder is stated in the Instructions to Bidders.

No bids may be withdrawn for thirty (30) days after the scheduled closing time for receipt of bids.

The Pennsylvania Turnpike Commission reserves the right to waive any informalities in or to reject any or all bids.

PENNSYLVANIA TURNPIKE COMMISSION
John F. Byrne
Secretary and Treasurer
Harrisburg, Pennsylvania
29 October 1956

Bids: November 14, 1956

Washington Suburban Sanitary Commission

INQUIRY O. 008904
FURNISHING AND DELIVERING MANHOLE FRAMES, COVERS AND STEPS, INLET FRAMES AND GRATES, LAMPHOLE FRAMES AND COVERS

Sealed proposals for furnishing and delivering six (6) Round Manhole Grating; twelve (12) sets W.S.S.C. Standard Square Inlet Frames & Grates; fifty (50) sets W.S.S.C. Lightweight Manhole Frames & Covers, covers marked with "W"; five-hundred (500) sets W.S.S.C. Standard Manhole Frames & Covers, covers marked with "S"; fifty (50) sets W.S.S.C. Standard Manhole Frames & Covers, covers marked with "W"; one-hundred (100) sets W.S.S.C. Standard Lamphole Frames & Covers, covers marked with "S"; ten (10) W.S.S.C. Standard Lamphole Covers (only) marked with "S"; three-thousand (3,000) W.S.S.C. Standard Manhole Steps and twenty-four (24) sets Watertight Manhole Frames & Covers, Caroline Foundry #129 or approved equal will be received in the office of the Purchasing Agent, Room G-13, of the Washington Suburban Sanitary Commission, 4017 Hamilton Street, Hyattsville, Maryland until Wednesday, November 14th, 1956 at 10:30 A. M. Eastern Standard Time, at which time and place they will be publicly opened and read.

Specifications may be obtained from S. Z. Salsberry, Purchasing Agent of the Commission.

T. Earle Bourne, Chairman
Frank L. Hewitt, Jr., V-Chairman
J. Norman Ager
James B. Bland
Willard A. Morris
L. S. Ray
Commissioners

Attest:
John T. Bonifant
Secretary

OFFICIAL PROPOSALS

Bids: November 19, 1956

City of Fort Lauderdale

NOTICE TO BIDDERS

Sealed bids will be received until 11:00 A.M. EST. on November 19, 1956, in the office of the City Manager of Fort Lauderdale, Florida, for

SECTION I —SIX WELLS AND PUMPING STATIONS
SECTION II —RAW WATER MAINS
SECTION III—WELL FIELD ELECTRICAL DISTRIBUTION AND APPURTENANCES.

Bidding blanks may be obtained from the office of the City Engineer. Plans and specifications are on file in the office of the City Engineer.

A deposit of $25.00 for plans and specifications, and of $25.00 each for additional copies of plans or specifications, will be required. All deposits for plans and specifications will be refunded upon their return in good condition within ten (10) days of the opening of bids.

A certified or cashier's check for 2% of the total amount of the bid, made payable to the City of Fort Lauderdale, Florida, shall accompany each proposal as evidence of the good faith and responsibility of the bidder. This check will be retained by the City as liquidated damages, should the bidder fail or refuse to enter into a contract with the City for the execution of the work embraced in the proposal in the event the proposal of the bidder be accepted.

The City of Fort Lauderdale reserves the right to waive any informality in any bid, and to reject any or all bids.

W. J. Veeder
City Manager

Bids: December 6, 1956

Contract No. E56-278

INVITATION TO BID

Sealed proposals will be received at the office of the Purchasing Agent, City of Hartford, Municipal Building, 550 Main Street until 2:00 p.m. Eastern Standard Time on December 6, 1956 for

NORTH AND SOUTH MEADOWS PUMPING STATIONS, 1956 REVISIONS

The bidder must file with his bid a certified check or Bid Bond for 10% of the total bid price, made payable to the City Treasurer of Hartford.

A satisfactory performance and payment bond for 100% of the contract price will be required of the successful bidder.

OFFICIAL PROPOSALS

Drawings and contract documents may be examined and obtained at office of City Engineer, Municipal Building, Hartford, and examined at office of Metcalf & Eddy, Engineers, 1300 Statler Building, Boston, Mass.; $50 deposit.

No bid may be withdrawn for a period of thirty (30) days after the opening of bids without the approval and written consent of the City Manager.

The right is reserved to waive technical defects or to reject any and all bids not deemed to the interest of the City.

CITY OF HARTFORD
BY N. B. Henson
PURCHASING AGENT

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation, Sealed bids (Specifications No. IDC-47961) will be received at El Paso, Texas, until November 27, 1956, for furnishing labor and materials for reconductoring the Elephant Butte-Socorro 115-kv transmission line, Rio Grande Project, New Mexico. Location near Truth or Consequence, New Mexico and Socorro, New Mexico. Principal items are furnishing and installing: 1,677 suspension- and deadend-types hardware assemblies; 243 X-braces; three 4/0 AWG ACSR conductors and restringing three similar existing conductors on 72 miles of transmission line; 126 hold-down weights of 50 to 180 pound size; and 168 vibration dampers; and other work. Completion time 90 days. For particulars, address Bureau of Reclamation, U. S. Courthouse, El Paso, Texas, or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation, Sealed bids (Specifications No. IDC-47931) will be received at Glendo, Wyoming, until December 6, 1956, for furnishing labor and materials for Earthwork, Structures, Bridge and Surfacing for Access Road to Fremont Canyon Power Plant, Missouri River Basin Project, Wyoming. Location 35 miles from Casper, Wyoming. Principal items are 281,600 cu. yds. excavation; erecting 190,000 pounds of Government-furnished structural steel for bridge; plant-mix bituminous surfacing for about 9 miles of road; and other work. Completion time 270 days. For particulars, address Bureau of Reclamation, P. O. Box 127, Glendo, Wyoming, or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

EMPLOYMENT OPPORTUNITIES

REPLIES (Box No.): Address to office nearest you c/o This publication Classified Adv. Div.
NEW YORK: P. O. Box 12 (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

Graduate Civil Engineer. Salary $5100 to $5600. No experience necessary. Good working conditions, vacation and insurance allowances. P-3334, Engineering News-Record.

Associate Engineer ($425 to $575) in New Mexico Health Department, B.S. in civil or sanitary engineering. Write: Merit System, Box 939, Santa Fe, New Mexico.

One M.E. and one E.E. graduate designer-draftsman to design, prepare plans and specifications for mechanical and electrical systems of large commercial building projects, including plumbing, heating, air conditioning, water supply and sewage treatment, electrical distribution, power and lighting. Permanent, established firm. Gamble, Pownell & Gilroy, Box 2465, Fort Lauderdale, Fla.

Engineers—Architects—Draftsmen. Experienced in design and supervision of construction on water works, sewers and general building construction. State experience, age, salary requirements and earliest date available. P-3332, Engineering News-Record.

Wanted—Part Time reinforcing detailers to work at home. Good rates for prompt service. Our personnel know of this ad. Apply P-3333, Engineering News-Record.

POSITIONS VACANT

Civil Engineer with experience in prestress concrete design to locate permanently with fifty year old firm now in production of prestress members. If necessary will train. State experience, references and educational resume. The Dextone Company, P. O. Box 606, New Haven, Connecticut.

Estimator—Buffalo, New York Area experienced on large building projects. Please furnish experience record and salary requirements. Johnson, Drake & Piper, Inc. 2760 Walden Avenue, P. O. Box 2567, Buffalo 25, New York.

Chairman of civil engineering department in college in New York State. Ph.D. desirable, not essential. Position open summer of 1957. P-3324, Engineering News-Record.

Professor or associate professor in civil engineering and mechanics. College in New York State. Term starting February or September 1957. Ph.D. desirable, not required. P-3328, Engineering News-Record.

Wanted: Office Engineers and Draftsmen experience in the design of municipal paving and sewer projects. Also construction inspectors for large sewer improvement project. Live in beautiful Ozarks, excellent school system—grade, high school and college—reasonable living costs, salary commensurate with training and experience, plus paid vacation and sick leave. Contact Personnel Department, City Hall, Springfield, Missouri.

(Continued on following page)

EMPLOYMENT OPPORTUNITIES

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P. O. Box 12, N. Y. 36. November 22nd issue closes November 12th

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McKEE has openings for top men to fill important, permanent positions, with excellent prospects for promotion to supervisory, staff and executive posts in our expanding organization.

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Investigate the advantages of top compensation, ideal working conditions, employment security, advancement opportunity and many generous benefits available to you at McKee.

Telephone TOwer 1-2300, Cleveland, Ohio or write to Edward A. Kolner, Arthur G. McKee & Company, 2300 Chester Ave., Cleveland 1, Ohio

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$3.00-$4.75 an hr.

Permanent jobs in fast growing industry for men with some exp. and the will to advance. Top-rated company with excellent employee benefits.

Ask for R. A. Beal
Call—Write—Wire

POSITIONS VACANT

(Continued from preceding page)

City Engineer: Unusual opportunity for graduate Civil Engineer or equivalent with professional license in southern Pennsylvania city. Experience essential in land surveying, street and sewer design and construction and related municipal work. Experience desirable in zoning and subdivision control. No structural design is involved. Would be in charge of Engineering Department, supervise survey crew and draftsmen, and would be expected to meet the public as required. Salary range $7,000 to $8,500 with usual benefits. Permanent non-political position for right man. Send resume of training and experience to: Borough of Chambersburg, 100 South Second Street, Chambersburg, Pa. Attention: J. G. Cree.

Draftsman—Experienced structural steel detailer. Permanent position in Jersey coast resort town. Apply Park Steel & Iron Company. Evergreen & R. R. Ave., Bradley Beach, N. J.

Wanted: Civil Engineer, registered in New Jersey, at least 10 years experience in road and bridge design and construction. Must have executive ability. State qualifications in full, experience resume, references and salary requirements. Reply to P-3307, Engineering News-Record.

Service Manager for fast growing equipment house Caribbean area must know Caterpillar Line also Excavating Equipment, permanent. Foreign language unnecessary. P-3216, Engineering News-Record.

Estimator for North Jersey Area—Experienced in heavy construction work, process piping, pipe lines, dams and bridges. Please submit complete resume, noting salary range and availability. P-3277, Engineering News-Record.

Teaching appointments for September, 1957, available at university-associated College of Engineering in field of Civil Engineering. Salary and rank commensurate with experience and academic qualifications. Primary teaching field open as present faculty is flexible; preference, if any, would be in sanitary engineering and allied fields. Suburban location, Middle West, adjacent to large industrial center. P-3268, Engineering News-Record.

Engineers for municipal and industrial water supply, sewerage and treatment projects. Opportunities for permanent connection with long established firm of consulting engineers in mid-west. Both E.I.T.'s and engineers considered. Full information and references in first letter requested. P-3116, Engineering News-Record.

Designers—Steel, Concrete, Electrical Piping. Air-Cond., Power Plants & Industrial Bldgs. Marbarry Corp., 120 Greenwich St., N.Y.C. Rector 2-3749.

A career for you in highway engineering. Recent graduates and experienced men are needed. Draftsmen, field engineers, bridge designers, road designers. Starting salaries, $5100-6300. Social security and state retirement. Vacation and sick leave. Employee credit union and hospitalization optional. Do you qualify? Write for application, details. Thomas E. Kilty, Personnel Director, Wyoming Highway Department, Cheyenne, Wyoming.

Civil Engineer: To supervise Engineering Department in rapidly growing Santa Clara Valley City. Population 21,000 will increase to 45,000. Must have 5 years experience in C. E. Salary range $553-673. Submit a letter of application giving experience, education and personal background to Personnel Office, City Hall, Mountain View, Calif.

POSITIONS VACANT

Associate and Assistant Professors for fields of advanced strength, elasticity, dynamics and fluid mechanics. Start Feb. or Sept. Dept. of Applied Mechanics, Univ. of Kansas, Lawrence, Kansas.

Engineers and draftsmen structural for steel and concrete design Public Buildings. Consulting Engineers office. Call or write giving training and experience. Saul Shaw & Co., 24 Commerce St., Newark, N. J.

Geologist, Eng'r. Geologist or Civil Eng'r. recent grad to 3 yrs experience to assist in program of research in drilling and coring in permafrost and glacier ice. Will be field party leader at research sites in Arctic and Antarctic. Base pay $3670-$5440 (GS-5-GS-9) depending upon experience. Extra pay in field. Snow, Ice and Permafrost Research Establishment, Corp of Engineers, U. S. Army, 1215 Washington Avenue, Wilmette, Illinois.

Wanted: Draftsmen, also Bridge Designers and Highway Designers, preferably with some field experience for major highway and bridge projects. Forward education and experience records along with salary requirements. Brookhart & Tyo, Consulting Engineers, 1729 N. Front Street, Harrisburg, Penna.

Structural Design Engineer. Opportunity for capable man to grow with progressive young engineering firm designing all types of reinforced-concrete and steel-frame buildings. Some experience preferred. Replies treated confidentially. Write Stuart H. Snyder, Consulting Engineer, 321 Denison Bldg., Syracuse, New York.

Junior Construction Cost Engineer. Some knowledge of estimating desirable. Excellent opportunity with long established international company. Location New York City. P-3347, Engineering News-Record.

Wanted. Civil Engineering Draftsmen. Ink Tracers, Computers, Land Surveyors. Only well qualified need apply. Give experience record and salary expected in first letter. P-3379, Engineering News-Record.

Carpenter foreman or carpenter superintendent who is qualified to take over 3 highway bridges and complete same. Must be thoroughly familiar with plans and specifications. P-3386, Engineering News-Record.

Mechanical or Chemical Engineer. Outstanding opportunity with long established midwestern company for graduate engineer with experience in selection, layout, and installation of food processing, packaging or chemical equipment. Mature young man desired who is capable of handling all phases of projects including estimating, design and field follow-up. Assignments in maintenance engineering also included in work. Salary commensurate with experience, liberal benefit program included. Send complete resume and salary requirement to Box P-3380, Engineering News-Record.

Mechanical Development Engineer. Engineer to assist in developing specialized manufacturing equipment not otherwise available. Must be qualified to lead a group investigating possible applications of the principles of automation to manufacturing and packaging operations. Candidates should have a good background of machine shop practice, an engineering degree from an accredited university and a genuine interest in devising and experimenting with mechanisms and machines. Permanent position with internationally established midwestern company. Salary commensurate with experience, liberal benefit program. Send complete resume and salary requirement to Box P-3384, Engineering News-Record.

(Continued on opposite page)

Engineers Architects

Highway Designers—Draftsmen
Rochester & Harrisburg, Pa., Jackson, Miss. & Ft. Lauderdale, Fla.
Bridge Designers—Draftsmen
Harrisburg, Pa.-College Park, Md.-Ft. Lauderdale, Fla., Jackson, Miss.
Architectural Designers—Draftsmen
Rochester, Pa.
Civil Engineering Draftsmen
Jackson, Miss.
Ink Tracers—Computors
Rochester, Pa., Jackson, Miss.

Air Mail Resume TO R. L. SHAW, *Personnel Director*

MICHAEL BAKER, Jr., INC.

BAKER BLDG. *Consulting Engineers* ROCHESTER, PA.

POSITIONS VACANT

(Continued from opposite page)

Structural Design Engineer with five years minimum experience design steel structures. Excellent opportunity with progressive medium size Engineering, Fabricating, and Erection Company. Location—Pennsylvania. Salary—Open. Send complete resume to P-3354, Engineering News-Record.

Experienced Estimator. Capable of preparing estimates, pricing, purchasing, subcontract negotiation. Permanent position with old established and progressive General Contractor located near Chicago. Send complete history including education, past experience, reference and salary expected. P-3361, Engineering News-Record.

EMPLOYMENT AGENCY

Wanted Engineers, Designers, Draftsmen All lines. Chemists, teachers and industrial engineers. Recent grads. Cleveland Engineering Agency 2132 E. 9, Cleveland.

EMPLOYMENT SERVICES

Salaried Positions $6,000 to $35,000. We offer the original personal employment service (established 46 years). Procedure of high standards individualized to your personal requirements. Identity covered. Particulars—R. W. Bixby, Inc., 559 Brisbane Bldg., Buffalo 3, N. Y.

Salaried personnel, $5,000-$30,000. This confidential service, established 1929, is geared to needs of high grade men who seek a change of connection under conditions assuring, if employed, full protection to present position. Send name and address only for details. Personal consultation invited. Jira Thayer Jennings, Dept. L, P. O. Box 674, Manchester, Vermont.

POSITIONS WANTED

Civil Engineer, 50. Administrative, executive, expressways, bridges, steel and concrete structures, sewage, design and construction. Available Nov. 22 PW-3293, Engineering News-Record.

Chief Draftsman heavy structural experience, with fabricating Co. Accustomed to assuming responsibility. Considering change as chief draftsman or chief engineer. Will relocate if position assures permanency and a future. PW-3297, Engineering News-Record.

Construction Engineer. Age 32; B.S.C.E. 10 years field and office experiences in industrial construction. Available to contractor or owner for position anywhere. PW-3289, Engineering News-Record.

Concrete Superintendent 32 years in concrete field batch & crushing plants. Experience, heavy construction, pre-cast, pier, power plants, industrial buildings, foundations, refineries, complete charge of placing & handling of concrete jobs up to 70,000 yds. Domestic or Foreign job. PW-3175, Engineering News-Record.

Construction Superintendent-Executive Capacity. Have managed a medium sized heavy construction company for 10 years. Bid to completion. Fed., State & Municipal projects. Age 36. Eastern States or foreign preferred. PW-3344, Engineering News-Record.

Construction Executive, Chief Estimator fully experienced, quantity survey to completion, subs, purchases, job manage heavy industrial, commercial, monumental, prefer N. Y., N.E., Mid-Atlantic States. PW-3313, Engineering News-Record.

SALES ENGINEERS

Architectural degree or equivalent experience desired. Job locations in mid western and eastern parts of United States. Contact Architects, Builders. Selling fabricated curtain wall panels and related steel products. Attractive salary, company car, expenses. Newly created sales division within nationally known corporation, opportunities unlimited. Send written resume to Personnel Manager, P. O. Box 1107 Harrisburg, Penna. Indicate preference as to working location and indicate present earnings.

Quantity Surveyor and Draftsman
Permanent position with well established company of mason contractors. Give age, education, experience and initial salary expected in first letter.
P-3311, Engineering News-Record
520 N. Michigan Ave., Chicago 6, Ill.

POSITIONS WANTED

Building Construction, over 30 years experience, estimating, buying, office management. Industrial, institutional and commercial projects. PW-3181, Engineering News-Record.

Project manager graduate professional engineer, 43. Heavy background in power and industrial plants—engineer — design — construction—management. Present project terminating. Staff available. PW-3287, Engineering News-Record.

Construction Supt. or Ass't. Available immediately. PW-3353, Engineering News-Record.

Registered Professional Engineers with available engineering manpower desire to invest in establishing an office to represent any consulting engineering or architectural firm, or to handle their excess of work in an excellent midwestern location. PW-3356, Engineering News-Record.

Administrative Construction Engineer, MCE., MS.IE. & Mgmt., P.E., 34, 13 years experience in design, office and field on dams, powerplants, buildings.—Cost control, planning, programming, econ. and eng. surveys and reports, manpower and flow of material. Seeking challenging assignment US or abroad. French, German, Spanish, Italian. PW-3350, Engineering News-Record.

Construction Executive 33. General manager, sales, architect, estimator, struct. steel, light industrial, commercial buildings. $15,000. PW-3372, Engineering News-Record.

Building Construction Superintendent: Over 25 yrs. experience as field Supt. on construction of Industrial, commercial & institutional bldgs; Large scale housing, churches etc; Similar position desired with organization offering long range opportunity, prefer near New Jersey. PW-3375, Engineering News-Record.

Retired. Many years experience in detailing, checking and designing structural steel work. Wants work in detailing and checking shop drawings. Own office, location Pittsburgh, Pa., PW-3392, Engineering News-Record.

Plan Your Future with BECHTEL in California on Hydro Electric Power Design

* Work in Los Angeles
* Liberal relocation allowances for you and your family
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Hydraulic
Experience

Engineers
Civil
Hydraulic
Structural
Electrical
Mechanical

Designers
Piping
Electrical
Structural

Men experienced in design of earthfill or concrete dams, spillways, penstocks and hydro electric power stations are desirable. Allied experience acceptable.

Send resume to
Manager of Employment & Placement
Industrial Relations Division

BECHTEL
Corporation
220 Bush St., San Francisco 4, Calif.

For an immediate personal interview you may phone:
Paul Keating, Plaza 7-4400, New York City
Joe Braddick, Fairfax 3-2401, Houston, Texas
Bill Milligan, Tucker 1549, Los Angeles, Calif.
Don Palmer, Douglas 2-4032, San Francisco, Calif.

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FOR HIGHWAY BRIDGE WORK
SENIORS and JUNIORS
Work in New York City and New Jersey

BROWN & BLAUVELT
468 Fourth Avenue, New York City
44 Cooper Street, Woodbury, New Jersey

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DESIGNERS
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Drainage Engineers

FOR OFFICE WORK IN ST. LOUIS ON HIGHWAYS EXPRESSWAYS AND ASSOCIATED CIVIL WORKS

- *Permanent employment for qualified men*
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DESIGNERS - DRAFTSMEN

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Application Form on Request
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Submit Resume - Minimum Salary

to

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220 W. LaSalle Ave.
South Bend, Indiana

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SENIOR ENGINEERS

Foreign Employment
Saudi Arabia

Field Engineers with refinery or related construction experience.

Office Engineers with heavy industrial construction experience on planning, estimating, costs, material takeoff, scheduling.

No Family Housing

Send resume to:
Manager of Employment & Placement
Industrial Relations Division

BECHTEL
Engineers and Builders
for Industry
220 Bush Street
San Francisco 4, California

STRUCTURAL DRAFTSMEN

FOR HIGHWAY BRIDGE WORK

In New York City and New Jersey

BROWN & BLAUVELT

468 Fourth Avenue, New York City

44 Cooper Street, Woodbury, New Jersey

ENGINEERS

Live and Work in a small progressive City near Columbus, Ohio. Positions open, Consultants office employing 40—50.

(A) Structural engineer, C.E. graduate, registered, with minimum 5 years experience designing reinforced concrete and structural steel. Supervision of structural design section.

(B) Mechanical or civil engineer with minimum 5 years experience design and/or constructing sewage and water treatment plants to check shop drawings and supervise construction work.

Salaries open; Permanent position for qualified engineers. Full information desired.

P-3305, Engineering News-Record
520 No. Michigan Ave., Chicago 11, Ill.

SUPERINTENDENT

Wanted by a substantial company now producing concrete masonry building units a superintendent to take charge of designing, building and operating an additional plant in which all types of pre-cast structural shapes will be produced.

Exceptional opportunity for the right man.

In making application, please state experience and salary desired.

P-3310, Engineering News-Record
520 No. Michigan Ave., Chicago 11, Ill.

ENGINEERS

Are you worth up to

$10,000 A YEAR?

Important permanent positions, paying from $6,500 to $10,000 a year with unusual future opportunity, have been created by the expansion program of our large, long-established engineering and construction firm. We need qualified engineers, designers and draftsmen experienced in structural, concrete, mechanical and piping design. Engineering offices are in several major American cities and Canada. Excellent working conditions. Generous company benefits. Our employees know of this ad.

Investigate this opportunity. Write today, giving age, education and experience. Your inquiry will be kept strictly confidential and will be answered promptly.

P-3067, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

CIVIL ENGINEER

Young civil engineer interested in broad application of civil engineering.

Excellent opportunity with consulting firm. Liberal benefit plans and good working conditions. Location Middle West.

Send resume of education and experience with salary requirements to:

P-3223, Engineering News-Record
520 No. Michigan Ave., Chicago 11, Ill.

MECHANICAL ENGINEERS

for

OPERATION & BETTERMENT
STEAM-ELECTRIC
PLANTS

Permanent career positions. 5 to 15 years experience; prefer ME grads—Diesel experience helpful but not essential

POSITIONS ARE IN NEW YORK

With infrequent trips to various subsidiaries in Latin American Countries

Large, old established service and supervisory organization for large group of electrical utilities

Liberal Company Benefits

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2 Rector Street, New York 6, New York
Personnel Dept. DI 4-4400 14 Floor

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Enjoy South Florida Climate.
Permanent positions with established Engineering-Architectural firm.

Write giving qualifications and references to

RADER AND ASSOCIATES
111 N. E. 2nd Avenue
Miami 32, Florida

Draftsmen, Designers and Engineers

Opportunity available for wide varied experience and advancement in Consulting Sanitary Engineers' office on several large interesting projects. Salary commensurate with experience and ability to assume responsibility. Usual fringe benefits offered relative to hospitalization, group insurance, etc. Location southwestern Ohio. Apply giving name, age, education, experience, and salary—or for an interview.

P-3371, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

TRAFFIC ENGINEER

Graduate Engineer with at least one year of traffic engineering experience or education. Experience in highway engineering desirable but not necessary.

SALARY: $6500 to $8000

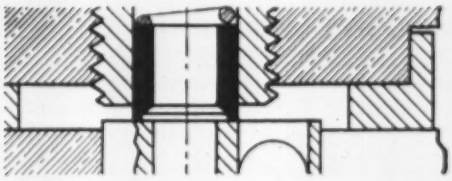
Apply: Malcolm E. Austin

CLARKESON ENGINEERING CO. INC.
285 Columbus Ave. Boston 16, Mass.

ENGINEER

Civil or mechanical engineering graduate preferred. Practical knowledge of soil mechanics desirable. Excellent opportunity for alert young engineer. Submit complete resume including salary desired.

RAYMOND CONCRETE PILE COMPANY
(Boring Division)
140 Cedar Street New York 6, N. Y.



MECHANICAL ENGINEERS

Continually expanding programs at Northrop Aircraft are creating new opportunities for mechanical engineers in the following areas: launching and landing gear design, hydraulics and pneumatics, control systems, and equipment.

You'll enjoy the fine spirit of cooperation at Northrop. The new multi-million-dollar engineering and science center, now nearing completion, will be a great place to work in, both as to its modern architectural design and newest scientific installations. You'll be associated with a top engineering team on such notable projects as Northrop's new supersonic trainer airplane, Snark SM-62 intercontinental missile, and other advanced aircraft and missile programs.

You'll be given constantly fresh, challenging assignments. Remuneration will be substantial, with many benefits that are unexcelled in the entire industry—health and life insurance, college educational reimbursement plan, regular vacations plus extra year-end vacations with pay, and a generous retirement plan.

At Northrop, the progress of personnel is important. Initiative and ability are recognized and encouraged, and full opportunity is given to present and discuss ideas.

You will find the career opportunity you are seeking at Northrop, pioneer in the design and production of all weather and pilotless aircraft. If you qualify for one of these attractive positions, contact the Manager of Engineering Industrial Relations, Northrop Aircraft, Inc., ORegon 8-9111, Extension 1893, or write to: 1015 East Broadway, Department 4600A, Hawthorne, California.

NORTHROP

NORTHROP AIRCRAFT, INC., HAWTHORNE, CALIFORNIA

Producers of Scorpion F-89 Interceptors and Snark SM-62 Intercontinental Missiles

CIVIL ENGINEERS

Work and live in wonderful WISCONSIN

A rapidly expanding highway program offers:

Permanent civil service positions
Rapid advancement
Challenging work

Starting salary based on experience

Civil engineering degree or professional registration required.

Write to:

Personnel Officer
State Highway Commission of Wisconsin
State Office Building
Madison 2, Wisconsin

ENGINEERS

Designers Detailers Draftsmen
for work on
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PERMANENT POSITIONS DEPENDING ON EXPERIENCE AND ABILITY
PAID VACATION, SICK LEAVE HOSPITALIZATION, LIFE INSURANCE
INCLUDE EDUCATION, EXPERIENCE, REFERENCES AND SALARY EXPECTED IN APPLICATION LETTER

Howard, Needles, Tammen & Bergendoff
1805 GRAND AVE. KANSAS CITY 8, MO.

ENGINEERS

Long established firm of consulting engineers with world-wide practice needs both beginners and experienced civil, electrical, mechanical, and foundation engineers for interesting work on large dams, powerplants, and river control works. Permanent positions. Liberal employee benefits. Starting salaries dependent on qualifications. Please send complete resume to Hugo Niemi, Personnel Manager.

HARZA ENGINEERING CO.
400 W. Madison St. Chicago 6, Ill.

SUPERINTENDENTS MASTER MECHANICS

Heavy Construction Equipment

Extensive mechanical experience and proven ability to supervise operators and mechanics required. Top starting salaries and opportunity for for advancement. Permanent work. Send complete details of personal background and experience to Personnel Director,

HECKETT ENGINEERING CO.,
612 North Main Street,
Butler, Pennsylvania

HIGHWAY ENGINEERS

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IN THAILAND
FOR

Construction Engineer
Road Construction Inspector
Soils Engineers
Bridge Construction Inspector
Survey Party Chief
Bridge & Road Designer

Must have college background and recent highway experience. Interviews arranged immediately for those qualified.

Send complete resume to:

SVERDRUP & PARCEL ENGINEERING CO.
1134 Locust St. St. Louis 1, Mo.

CIVIL ENGINEER

British Guiana

Very good opportunity for young, married engineer interested in South America. Transportation furnished; company housing available. Require 5 years construction experience. In letter give age, education, types of construction projects handled, and salary required.

P-3265, Engineering News-Record,
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

PROJECT ENGINEER

To take complete charge of organization and construction of large, multi-story, center city, apartment development. Must be experienced. Compensation commensurate with ability. Give complete details.

P-3331, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

DESIGNERS and DRAFTSMEN HIGHWAYS and BRIDGES

Experienced men send resume and salary expected to—

C. W. RIVA CO.
511 Westminster St. Providence 3, R. I.

HYDRAULIC DESIGN ENGINEER

With 5 to 10 years' experience in Water Supply and Sewage Works, including design of treatment units, hydraulics, hydrology, structures, piping and the equipment involved in such work. We can offer the man meeting these qualifications an adequate salary and promising future with a prominent New York firm.

P-2908, Engineering News-Record
Class. Adv. Div. P.O. Box 12, N.Y. 36, N.Y.

ARCHITECTURAL ENGINEER

Architectural Engineer between ages of 25 and 35 with interest in design of industrial buildings and structures.

Excellent opportunity with consulting engineering firm in Middle West. Liberal benefit plans and good working conditions.

Send resume of education and experience with statement of salary requirements to:

P-3222, Engineering News-Record
520 No. Michigan Ave., Chicago 11, Ill.

ENGINEERS

Civil & Structural

Permanent positions for squad leaders, designers and draftsmen with established consulting firm for large hydro-electric and irrigation projects. Liberal benefits. Salary commensurate with qualifications. Submit complete experience record and salary requirements.

ERIK FLOOR & ASSOCIATES, INC.
139 N. Clark St. Chicago 2, Ill.

CLASSIFIED SEARCHLIGHT SECTION ADVERTISING

BUSINESS OPPORTUNITIES — EQUIPMENT - USED or RESALE

UNDISPLAYED RATE:

$2.10 a line, minimum 3 lines. To figure advance payment count 5 average words as a line.

PROPOSALS $2.10 a line an inseration.

BOX NUMBERS count as one line additional in undisplayed ads.

DISCOUNT of 10% if full payment is made in advance for four consecutive inserations of undisplayed ads (not including proposals).

DISPLAYED RATE:

The advertising rate is $23.60 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.

AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches—to a page.

EQUIPMENT WANTED or FOR SALE ADVERTISEMENTS acceptable only in Displayed Style.

Send NEW Ads or Inquiries to Class. Adv. Div. of Engineering News-Record, P. O. Box 12, N. Y. 36, N. Y. November 22nd Issue Closes Nov. 12th.

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Editorials

Engineers Can Do More

FROM THE STUDY presented in this issue in the special report on engineering manpower—incidentally, the first such study to be focused exclusively on engineers in construction and basically civil engineers—it would appear that the solution for whatever problem exists rests solely in the hands of management. There is a shortage, but it is not so critical that it cannot be outstripped by increased productivity, which it is management's responsibility to generate. How? By using more technicians in non-professional-level jobs, by up-grading engineers in position and pay to cut down employee turnover, by organizing staffs to utilize available talents better, by seeking new methods and putting them to use.

These are all management functions. Reading the report with that in mind will sharpen its meaning and enhance its value. For the inescapable conclusion is that engineers can do more, but that management has to give them the tools, the latitude and the incentive.

Better Building Inspection

A NEW MANUAL of Recommended Practice for Inspection and Testing of Concrete Materials and Concrete now under study by the Concrete Industry Board of New York City proposes that inspection firms should be engaged by the architect, the engineer or the owner instead of by the contractor. If adopted and followed, this provision of the manual will correct an unhealthy condition which has needed correction for a long time, not only in the New York area but elsewhere.

How the practice of requiring contractors on building work to hire the inspecting firms began is not known. One theory is that the system was inaugurated to conceal that part of the overhead cost from owners who might ask why the architect should not do the inspecting as part of the service to be included under his fee.

But regardless of how the practice started, it is unsound. A contractor should not be required to employ the men who are to inspect his work. That can lead to situations which at best are embarrassing to both the contractor and the inspecting firm and at worst are conducive to collusion at the expense of the owner.

Further, the practice provides no incentive for the contractor to get the best possible inspection. When the cost of employing an inspection firm must be added to the contractor's bid, price becomes the controlling factor. And the less the inspectors do for their money and still get by, the less trouble the contractor will have in getting by with substandard workmanship. At the very least, such a setup does not encourage thorough inspection.

If the designers engage the inspection firm, on the other hand, this situation will be changed. Price may still remain a factor, but should not be the controlling one. The designers and the owner will want thorough inspection and, as a consequence, will seek to employ skilled and dependable inspection organizations.

The needed transformation, however, cannot come about merely by asking contractors not to hire inspection firms nor by requesting testing laboratories to refuse to seek such inspection work. If specifications require a contractor to engage and pay for such services, he has no alternative but to do so if he is awarded the construction contract. And on their part, the testing laboratories will frequently be faced with the problem of paring prices when confronted with contractors seeking a minimum inspection expense.

The logical solution is for architects and engineers to assume the responsibility for engaging inspection services. And if they do not wish to handle the payments—at least during a transition period until owners become accustomed to footing the bill directly—the specifications can call for an allowance to be made by the contractor in his bid price for paying for inspection.

Use of Missouri River Water

THE DIVERGENT OPINIONS as to how water stored behind new dams on the Missouri River is to be used, which were expressed at a recent meeting of the Missouri Basin Inter-Agency Committee (ENR Oct. 4, p. 27), highlight the fact that there is no perfect solution for the problems raised by structures built to regulate the flow of large rivers. Changes in the flow to satisfy the people most interested in flood control or navigation may not suit those whose chief interest is power.

On the Missouri River, the people in the lower part of the valley are interested primarily in flood control and navigation, and so they want the flow regulated in one way, whereas the people in the upper part of the valley where the dams are located want the maximum amount of firm power from those dams. Nevertheless, the basic interests of the power and navigation people are not as far apart as speakers at the committee meeting in Mitchell, S. D., made them appear. Both are benefited by an increase in the low flow of the river. Where serious conflicts can arise is between these two and the people interested primarily in flood control. Reservoir volume assigned to flood storage in a multipurpose project must be empty at the time when floods begin to come down the river. It must not be held full in order to assure maximum power generation benefits.

All of which points to the need for continuing supervision of the operation of multipurpose reservoirs by an agency on which all interested parties are represented. Possibly the present inter-agency committee can provide the needed control. If not, a new agency could be set up by a compact among the states of the Missouri basin.

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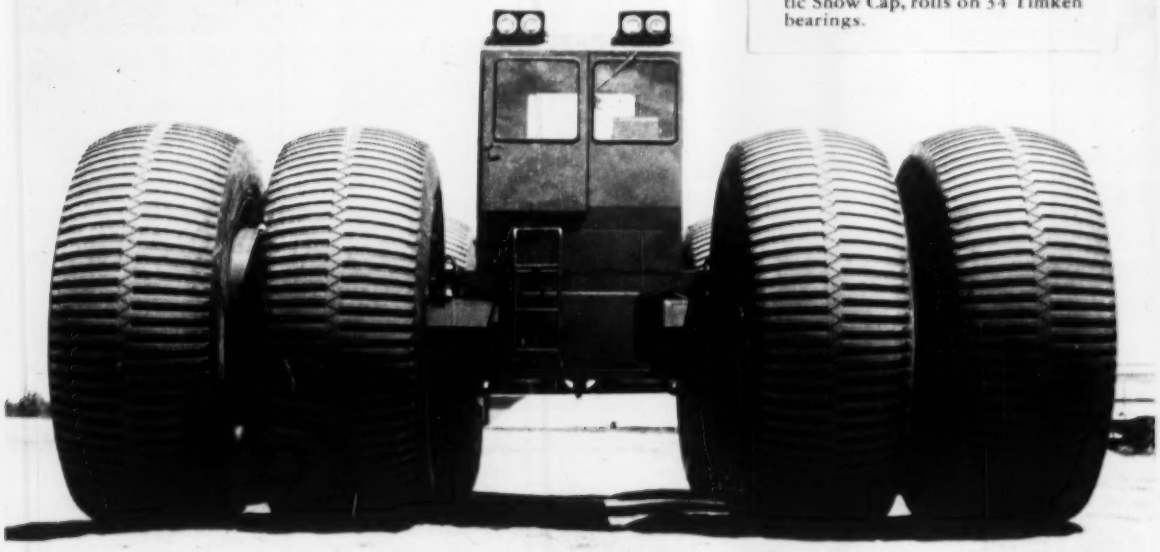
Rugged service like this means that its bearings have to take tremendous radial and thrust loads. That's one reason LeTourneau engineers specified Timken tapered roller bearings. Because of their tapered construction, Timken bearings take radial and thrust loads in any combination. They can take sudden shock loads, too, because their rollers and races are case-carburized to give them a hard, wear-resistant surface over a tough, shock-resistant core.

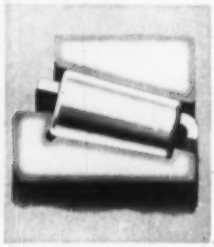
Line contact between rollers and races permits Timken bearings to carry the Sno-Buggy's heavy wheel loads. And the Sno-Buggy's huge dual tire wheels turn easily because Timken bearings are geometrically designed to have true rolling motion and precision manufactured to live up to their design. We even make our own steel to be sure of getting the best. We're the only U. S. bearing manufacturer that does.

Always specify Timken tapered roller bearings when you buy or build machines. Look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

Revolutionary LeTourneau Sno-Buggy, recently tested on the Arctic Snow Cap, rolls on 34 Timken bearings.





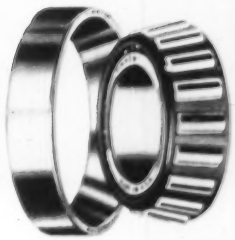
GREATER LOAD AREA

Because the load is carried on the *line* of contact between rollers and races, Timken bearings carry greater loads, hold shafts in line, wear longer. The Timken Roller Bearing Company is the acknowledged leader in: 1. advanced design; 2. precision manufacturing; 3. rigid quality control; 4. special analysis Timken steels.

TIMKEN

TRADE-MARK REG. U.S. PAT. OFF.

TAPERED ROLLER BEARINGS



NOT JUST A BALL ○ NOT JUST A ROLLER ○ THE TIMKEN TAPERED ROLLER ○ BEARING TAKES RADIAL ○ AND THRUST ○ LOADS OR ANY COMBINATION